

## Control Interface Studio – Getting Started

### Installation Guide



### General Precautions

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or using this software.

Practice all plant and safety instructions and precautions.

Failure to follow instructions can cause personal injury and/or property damage.



### Revisions

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, check manual **26455**, *Customer Publication Cross Reference and Revision Status & Distribution Restrictions*, on the *publications* page of the Woodward website:

[www.woodward.com/publications](http://www.woodward.com/publications)

The latest version of most publications is available on the *publications* page. If your publication is not there, please contact your customer service representative to get the latest copy.



### Proper Use

Any unauthorized modifications to or use of this software may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.



### Translated Publications

If the cover of this publication states "Translation of the Original Instructions" please note:

The original source of this publication may have been updated since this translation was made. Be sure to check manual **26455**, *Customer Publication Cross Reference and Revision Status & Distribution Restrictions*, to verify whether this translation is up to date. Out-of-date translations are marked with . Always compare with the original for technical specifications and for proper and safe installation and operation procedures.

**Revisions**— A bold, black line alongside the text identifies changes in this publication since the last revision.

Woodward reserves the right to update any portion of this publication at any time. Information provided by Woodward is believed to be correct and reliable. However, no responsibility is assumed by Woodward unless otherwise expressly undertaken.

# Contents

---

<b>CHAPTER 1. INTRODUCTION .....</b>	<b>3</b>
<b>CHAPTER 2. FRAMEWORK INSTALLATION .....</b>	<b>4</b>
Hardware Requirements .....	4
Licensing and Distribution .....	4
Qt Account Web Portal.....	4
License verification.....	6
CIS Library Kit .....	7
CIS Kit .....	8
Further Reading .....	9
Troubleshooting .....	9
Debugging.....	14
Graphics Drivers .....	16
<b>CHAPTER 3. CIS OVERVIEW AND PROJECT CREATION.....</b>	<b>18</b>
CIS Overview .....	18
Project Creation .....	19
Using the Help Files for Project Development .....	23
<b>CHAPTER 4. SETTING UP HARDWARE .....</b>	<b>25</b>
Service Packs .....	25
<b>REVISION HISTORY .....</b>	<b>28</b>

The following are trademarks of Woodward, Inc.:  
Woodward

The following are trademarks of their respective companies:  
Qt (The Qt Company)

## Illustrations

Figure 2-1. QT Account Home .....	5
Figure 2-1. Qt Account, Licenses, and Subscriptions .....	6
Figure 2-2. Qt Account, CIS Library Kit Download .....	7
Figure 2-3. Qt Account, CIS Kit Download.....	8
Figure 2-5. Help .....	9
Figure 2-6. Tools->Options Dropdown Menu.....	10
Figure 2-7. Build & Run Screen .....	10
Figure 2-8. Qt Version Configuration .....	11
Figure 2-9. Kit Configuration .....	12
Figure 2-10. Documentation Files.....	13
Figure 2-11. Debugger Installation Steps .....	14
Figure 2-12. Kit Configuration with Debugger.....	15
Figure 2-13. Debug View .....	16
Figure 3-1. CIS Tool Welcome Screen .....	18
Figure 3-2. Welcome Menu.....	19
Figure 3-3. main.qml File .....	20
Figure 3-4. main.qml File Contents.....	21
Figure 3-5. PC Simulation Projects Menu.....	22
Figure 3-6. PC Simulation Run Button.....	23
Figure 3-7. CIS Library Kit Manual.....	24
Figure 4-1. AppManager Window, Control Pull Down Menu .....	25
Figure 4-2. License Agreement Page .....	26
Figure 4-3. Service Pack File Directory .....	26
Figure 4-4. AppManager Control Information Screen.....	27

# Chapter 1.

## Introduction

---

The Woodward Control Interface Studio (CIS) Kit is a cross-platform application used for developing Graphical User Interfaces (GUI) for Woodward GAP based controllers.

The CIS provides a design environment that allows programmers to easily develop GUI applications in a visual editor. The CIS includes a library of Woodward components that can be tied to GAP variables enabling users to read and write data to and from the control application.

This document describes the process of environment setup for Woodward GUI development on a Windows based PC as a host. The tools included in the CIS kit allow for the development, testing, and debugging of GUI applications without the target hardware using a PC simulator. The CIS also provides the tools to generate Woodward GUI (WGUI) files that run on compatible Woodward controllers with an integrated display.

There are two installation packages needed to develop Woodward GUI applications. The first is the CIS Kit which provides the Integrated Development Environment (IDE) for developing GUI applications. The second is the CIS Library Kit which provides platform specific Woodward component libraries and PC simulation tools.

Included screen captures may vary depending on versions being used and other already installed components (other Qt's, compilers, etc.). Recommend removing old versions before proceeding. Please follow naming convention installing different versions.

## Chapter 2. Framework Installation

---

### Hardware Requirements

CIS Kit installers are available for computers running 32-bit or 64-bit version of Windows 7, Windows 8, Windows 8.1, or Windows 10 operating system. The computer must meet hardware requirements specified for the operating system and include graphics adapter with OpenGL 2.1 or DirectX 9 as minimum.

### Licensing and Distribution

CIS Kit is licensed software and licenses are assigned to named individuals who must obtain a license through Woodward and accept Woodward license agreement to develop GUI applications.

The CIS Kit is software based on the Qt framework. The Qt Company (a sublicensee of an agreement with Woodward) provides distribution and license verification mechanisms through its Qt Account Web portal (<https://account.qt.io>).

### Qt Account Web Portal

CIS Kit users (identified by its email address) obtain individual access to the Qt Account Web portal (<https://account.qt.io>) when ordering a license. The user receives an email notification of Qt account creation and is required to activate it within 72 hours by clicking the emailed link and setting a password.

The Qt Account is a unified login to all Qt resources, including those specific to Woodward and those generically distributed by The Qt Company. It provides details about user licenses, available downloads and guides on where to get additional help.

Qt

Log out Menu

[Qt Account Home](#)  
[Licenses and Subscriptions](#)  
[Downloads](#)  
[My Profile](#)  
[Support Center](#)

# Your unified login to everything Qt

Exclusive offer for Qt Account users:

- › [On-demand videos of all the sessions at Qt World Summit 2016](#)
- › [The Qt Company Support FAQ knowledge base](#)

Your license has expired. [Renew your license.](#)

## Useful Quick Links:

- › [Documentation](#)
- › [Getting Started](#)
- › [Qt Blog](#)
- › [Qt Wiki](#)
- › [Qt Forum](#)
- › [Qt Bug Tracker](#)

Figure 2-1. QT Account Home

## License verification

The CIS Kit license verification happens at installation time. The installation process will require the Qt Account login and password (for online verification) **or** license key (for offline verification). The license key and other license details (including license agreement and certificate) are available in Qt Account, in “*Licenses and Subscriptions*” section.

Qt Account Home  
Licenses and Subscriptions  
Downloads  
My Profile  
Support Center

# Licenses and Subscriptions

Here you can find information about your Qt licenses and subscriptions.

Select License

Woodward CIS Kit - Flex500 (1796-3131) 2693898

Woodward CIS Kit		WOODWARD
License ID:	2693898	
Product:	Flex500 (1796-3131)	
License Type:	Perpetual	
Status:	Active	
Created:	03.02.2017 18:44	
Next renewal:	03.02.2018	
License Key:	Y [redacted] 2	
Deployment Platforms:	Flex500 and derivates, including Flex505	
Development Platforms:	Windows	

[Upgrade](#) [Download Qt License](#)

[Qt License agreement](#) [Qt Support agreement](#) [Qt License Certificate](#)

Figure 2-1. Qt Account, Licenses, and Subscriptions

## CIS Library Kit

The CIS Library Kit is a platform specific, supporting package for Control Interface Studio Kit. The package includes all necessary libraries, add-ons, and control simulator for Woodward devices only.

CIS Library Kit installers are available for download in Qt Account, in the “Downloads” section. Correct version (Part Number and Revision) supporting a specific Woodward device are automatically pulled based on selected license.

Select the desired license for Woodward devices (note: license selection is visible only when more than one license is available), “Woodward CIS Library Kit” product and the version. Under “Downloads”, the unfold title to see details and download link. See Figure 2-2 for Flex500 example.

The screenshot shows the Qt Account interface. At the top left is the Qt logo. At the top right are links for 'Log out' and a 'Menu' icon. On the left side, there is a navigation menu with links: 'Qt Account Home', 'Licenses and Subscriptions', 'Downloads' (which is underlined), 'My Profile', and 'Support Center'. The main content area is titled 'Downloads' and contains the text 'Find and download Qt libraries and add-ons.' Below this is a 'Select License' section with a dropdown menu showing 'Woodward CIS Kit - Flex500 (1796-3131) 2693898'. Underneath are two columns: 'Product:' with a dropdown showing 'Woodward CIS Library Kit' and 'Version:' with a dropdown showing 'NEW'. Below the selection area is another 'Downloads' section with a link: '> Woodward Flex500 CIS Library Kit (9927-2537) offline installer for Windows'. A green 'Download' button is positioned below the link. Under the button is a description: 'Description: Woodward CIS Library Kit (9927-2537) is a hardware support package for Woodward Control Interface Studio Kit (9927-2521) allowing to develop GUI for Woodward Flex500 platforms and derivatives, including Flex505'. At the bottom of the screenshot is a 'Get Started' section with three links: 'Woodward getting started instructions', 'Qt getting started instructions', and 'Qt documentation'.

Figure 2-2. Qt Account, CIS Library Kit Download

Uninstall the current version using the uninstaller from Start Menu, and then run the downloaded package. When asked by installer to verify license, enter your Qt Account details or license key.

The installer is set to automatically add newly installed CIS Library Kits that should be visible as a “Kit” and “Qt version” in Qt Creator settings.

**Note:** A red exclamation mark may be visible next to “Kit” as there may be no compatible compiler installed. A compiler is not needed to build GUI applications, so the mark may be ignored.

## CIS Kit

Control Interface Studio Kit for Windows is an Integrated Development Environment used for GUI development and debugging based on Qt Creator software.

CIS Kit installers are available for download in Qt Account, in the “Downloads” section. A correct version (Part Number and Revision) supporting a specific Woodward device is pulled automatically based on the selected license.

Select the desired license for Woodward devices (note: license selection is visible only when more than one license is available), “Woodward CIS Kit” product, and the version. Under “Downloads”, unfold title to see details and download link. See Figure 2-3 for Flex500 example.

**Note:** CIS Kit is intended to be as common as possible and in most cases, the same version can be used for development for various Woodward devices. Before downloading and installing, verify if the same version (Part Number and Revision) is not installed yet.

The screenshot shows the Qt Account interface. At the top left is the Qt logo. On the right, there is a user profile 'Test2 Woodward', a 'Log out' link, and a 'Menu' icon. The main content area has a left sidebar with links: 'Qt Account Home', 'Licenses and Subscriptions', 'Downloads' (highlighted), 'My Profile', and 'Support Center'. The main heading is 'Downloads' with the subtext 'Find and download Qt libraries and add-ons.' Below this is a 'Select License' section with a dropdown menu showing 'Woodward CIS Kit - Flex500 (1796-3131) 2693898'. Underneath are two more dropdown menus: 'Product:' with 'Woodward CIS Kit' and 'Version:' with 'NEW'. A 'Downloads' section follows, listing '> Woodward CIS Kit (9927-2521) offline installer for Windows' with a green 'Download' button. A description below reads: 'Description: Woodward Control Interface Studio Kit (9927-2521) is a cross-platform integrated development environment (IDE) tailored to the needs of GUI developers for Woodward hardware platforms'. At the bottom is a 'Get Started' section with links for 'Woodward getting started instructions', 'Qt getting started instructions', and 'Qt documentation'.

Figure 2-3. Qt Account, CIS Kit Download

Uninstall the current version using the uninstaller from Start Menu and then run downloaded package next. When asked by the installer to verify license, enter your Qt Account details or license key. The installer is set to automatically detect previously installed CIS Library Kits.

## Further Reading

The Help system is available in Qt Creator under the “*Help*” button from left menu or F1 when QML component is selected.

Use the integrated help system to assist with GUI application development.

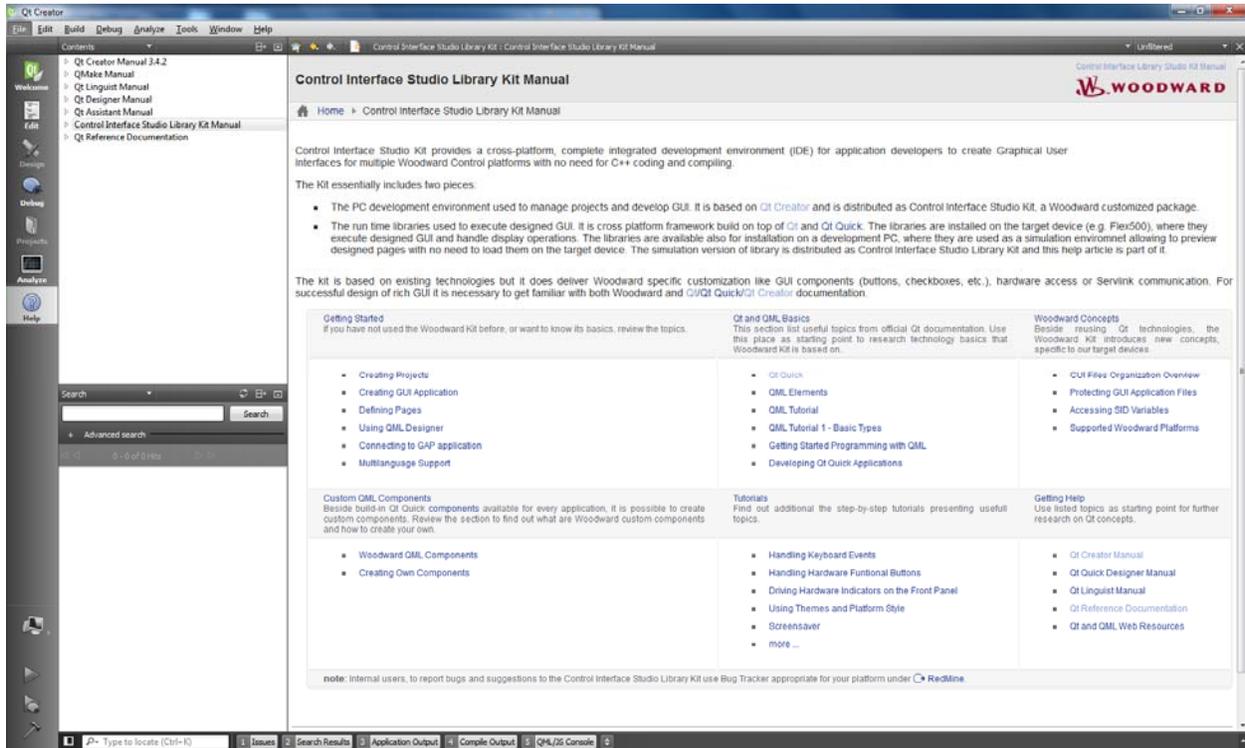


Figure 2-5. Help

## Troubleshooting

### Kit or Qt version

The CIS Kit and CIS Library Kit installers are set to automatically configure Qt Creator with Kit and matching Qt version. Follow the manual instruction if this was not successful or there is a need to do a custom configuration.

Start Qt Creator from Start Menu and configure available Qt versions by opening “*Tools->Options*” (see Figure 2-6).

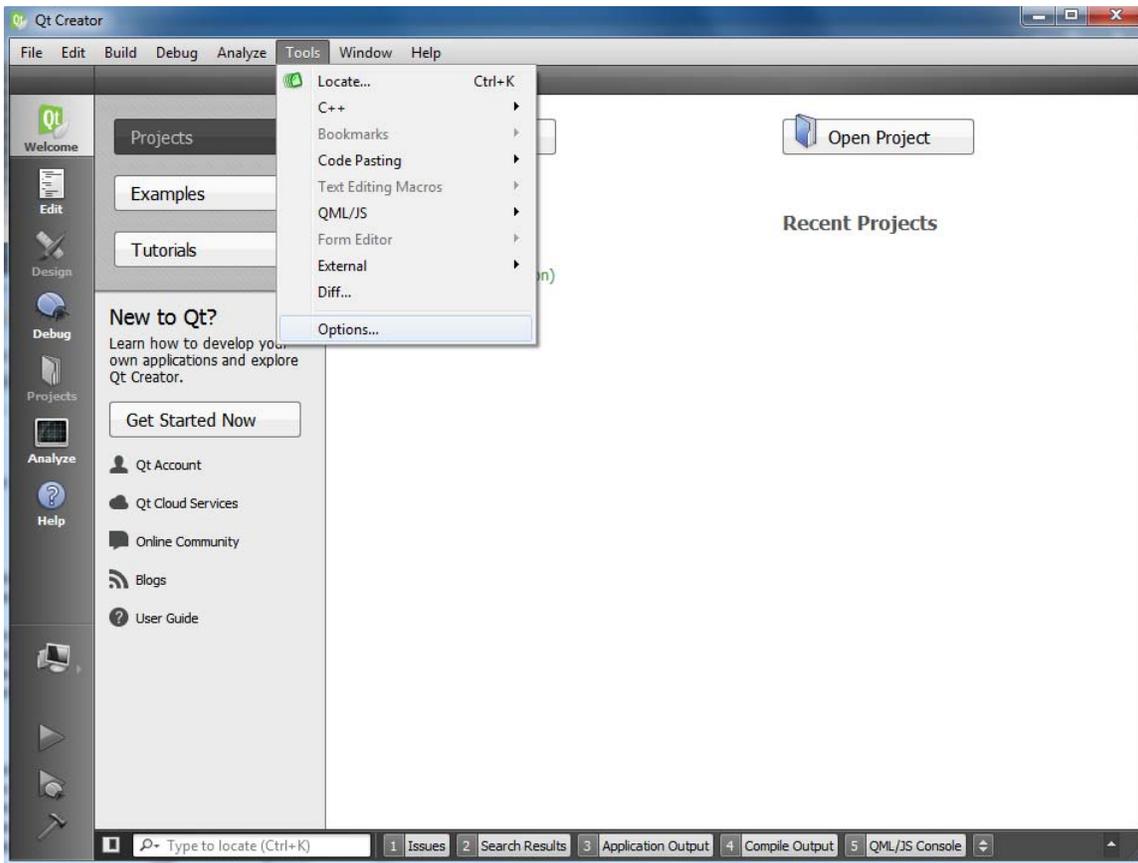


Figure 2-6. Tools->Options Dropdown Menu

Switch to the “Build & Run” tab on the left menu and then to the “Qt Versions” tab on the upper tab list (see Figure 2-7.).

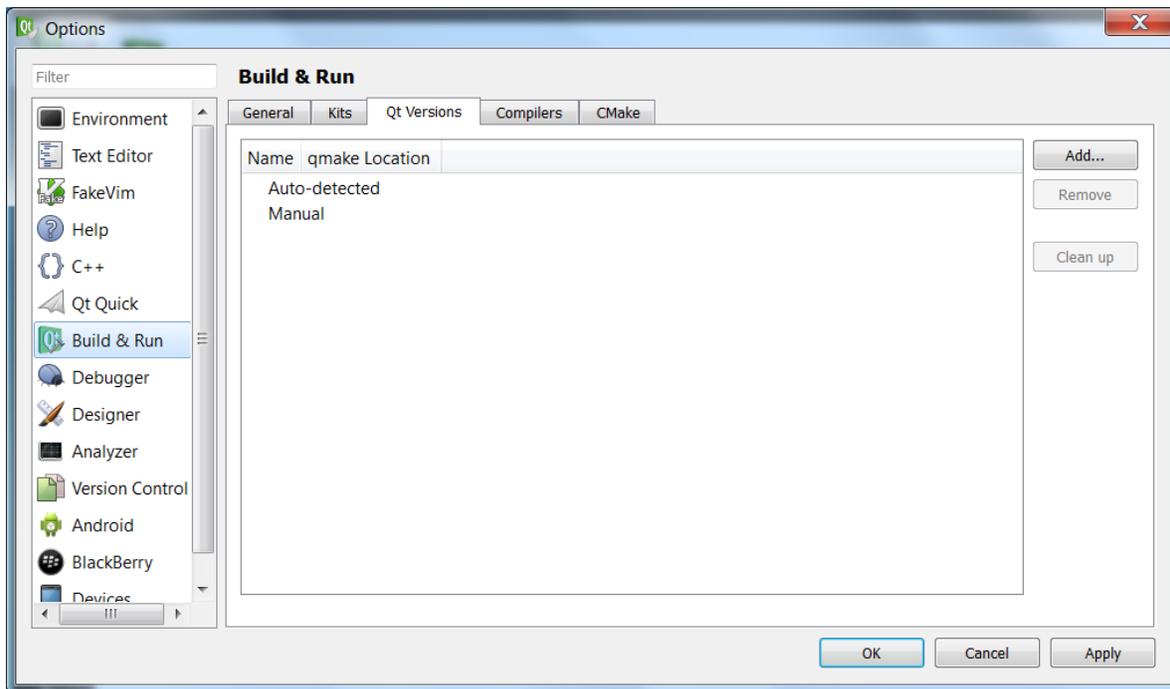


Figure 2-7. Build & Run Screen

Press the “Add...” button and navigate to qmake.exe located in “C:\WcQt\Qt\9927-2537\_NEW\bin”. The Qt version from Control Interface Studio Library Kit should be added (see Figure 2-8.). Apply changes.

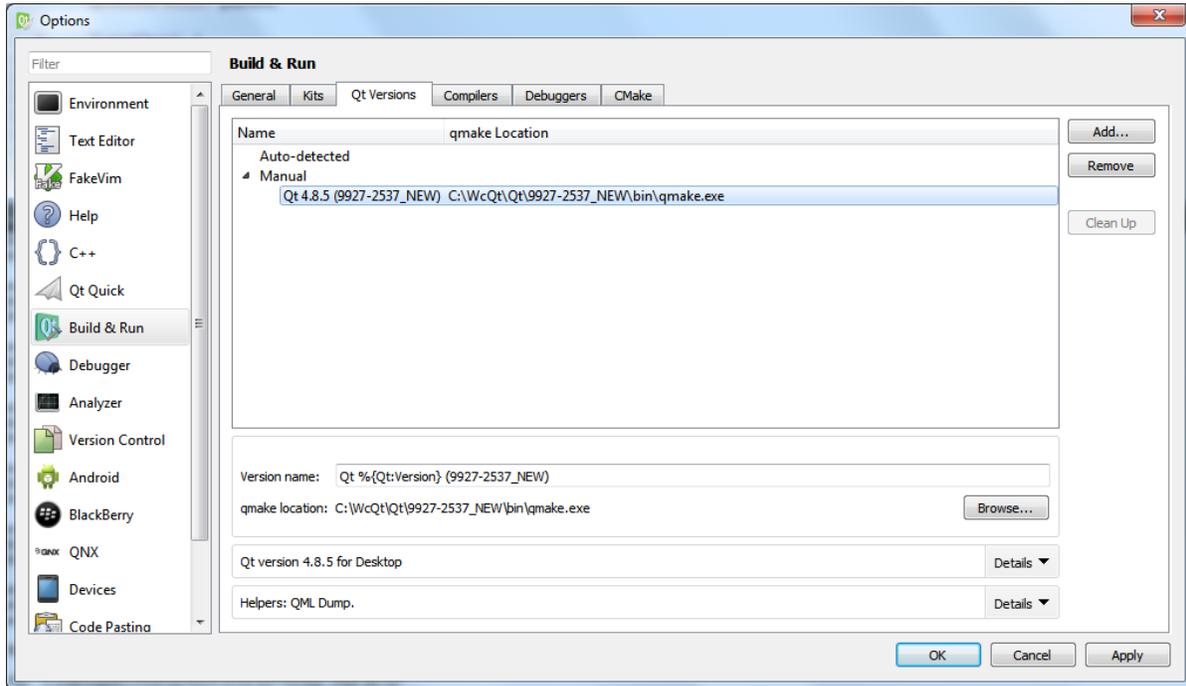


Figure 2-8. Qt Version Configuration

**Note:** A red exclamation mark may be visible, as you may not have any compatible compiler installed. You do not need compiler to build GUI applications.

**Note:** Remove all other Qt versions if they are unused, some are created automatically, and do not have any value added.

Switch to the “Kits” tab in the upper tab list. Create a new Kit by pressing “Add”. Fill in all fields as on Figure 2-9. Set the new kit as default by selecting it and pressing “Make Default” button.

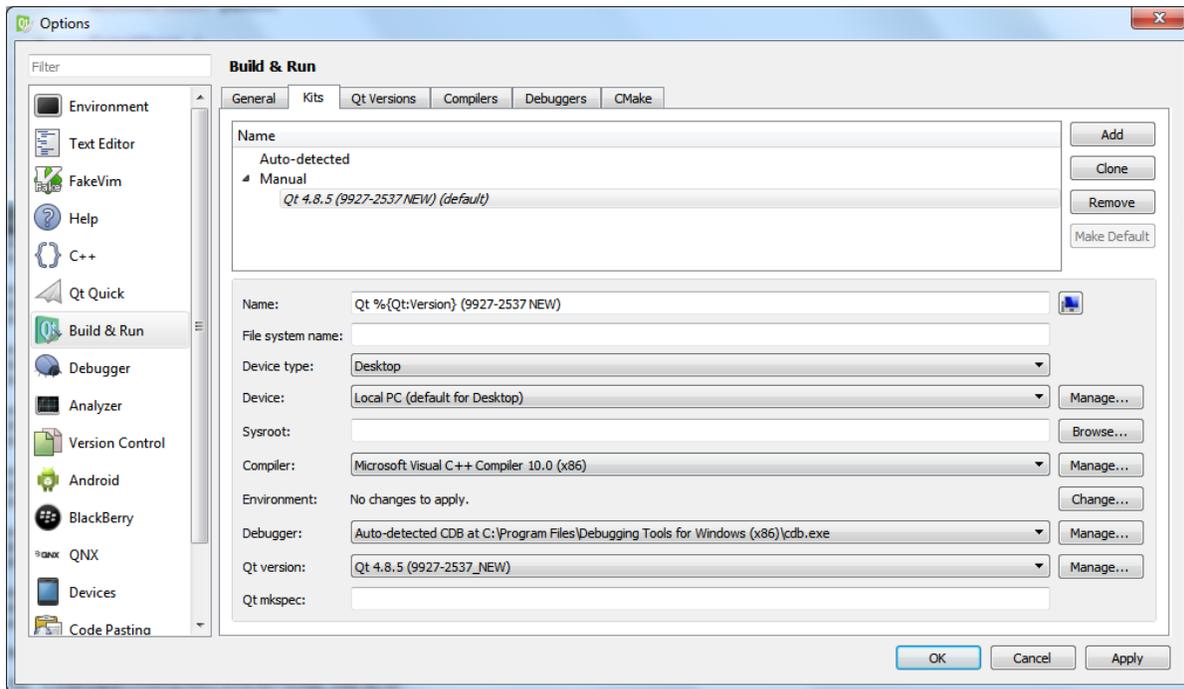


Figure 2-9. Kit Configuration

**Note:** Remove all other Kits if they are unused, some are created automatically, and do not have any value added.

Installed Qt package contains few documentation/help files. The files are usually detected automatically during “Qt Versions” setup.

Switch to “Help” tab on the left menu and then to “Documentation” tab on upper tab list (see Figure 2-10/Figure 2-7.). Check if all files have been detected, otherwise use “Add...” button to add all files from Qt “doc” subdirectory.

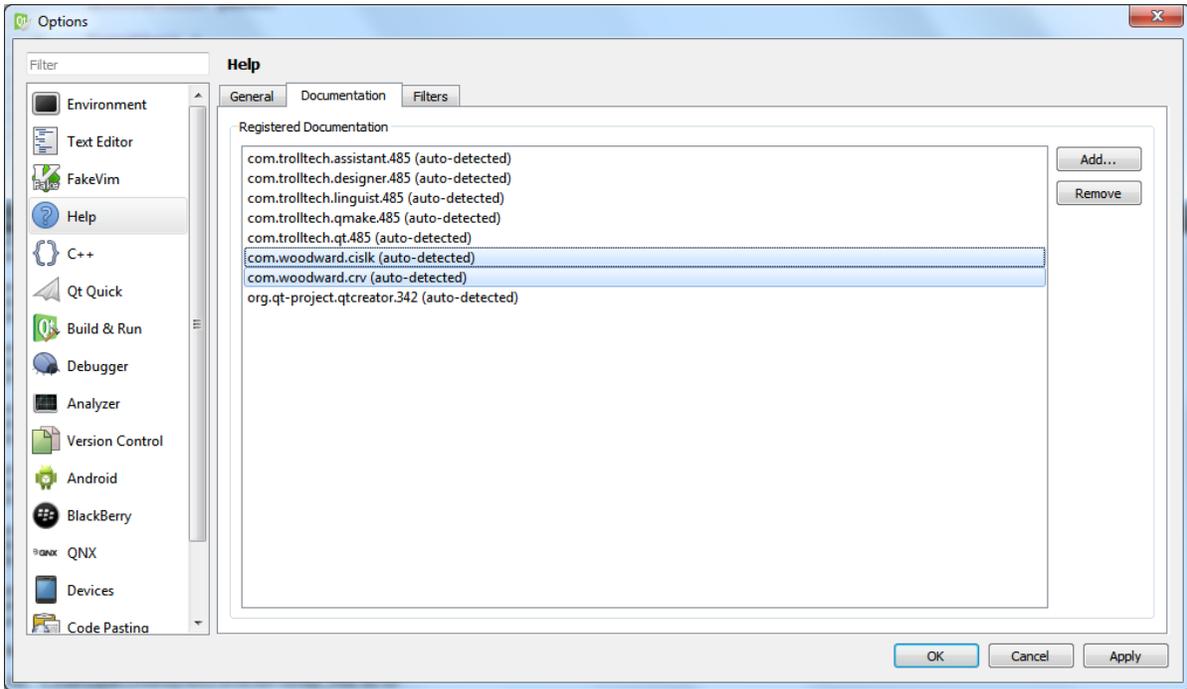


Figure 2-10. Documentation Files

## Debugging

Debugger is an additional software for tracking/analyzing/monitoring running applications. Although it is not necessary for QML development, it may help debugging Java Script code. Installation is optional.

Debugger depends on platform and compiler being used. Here a CDB debugger for Windows applications will be described. Download installation package from following page: <http://msdn.microsoft.com/pl-pl/windows/hardware/hh852363>. Run it and follow instructions as on Figure 2-11.

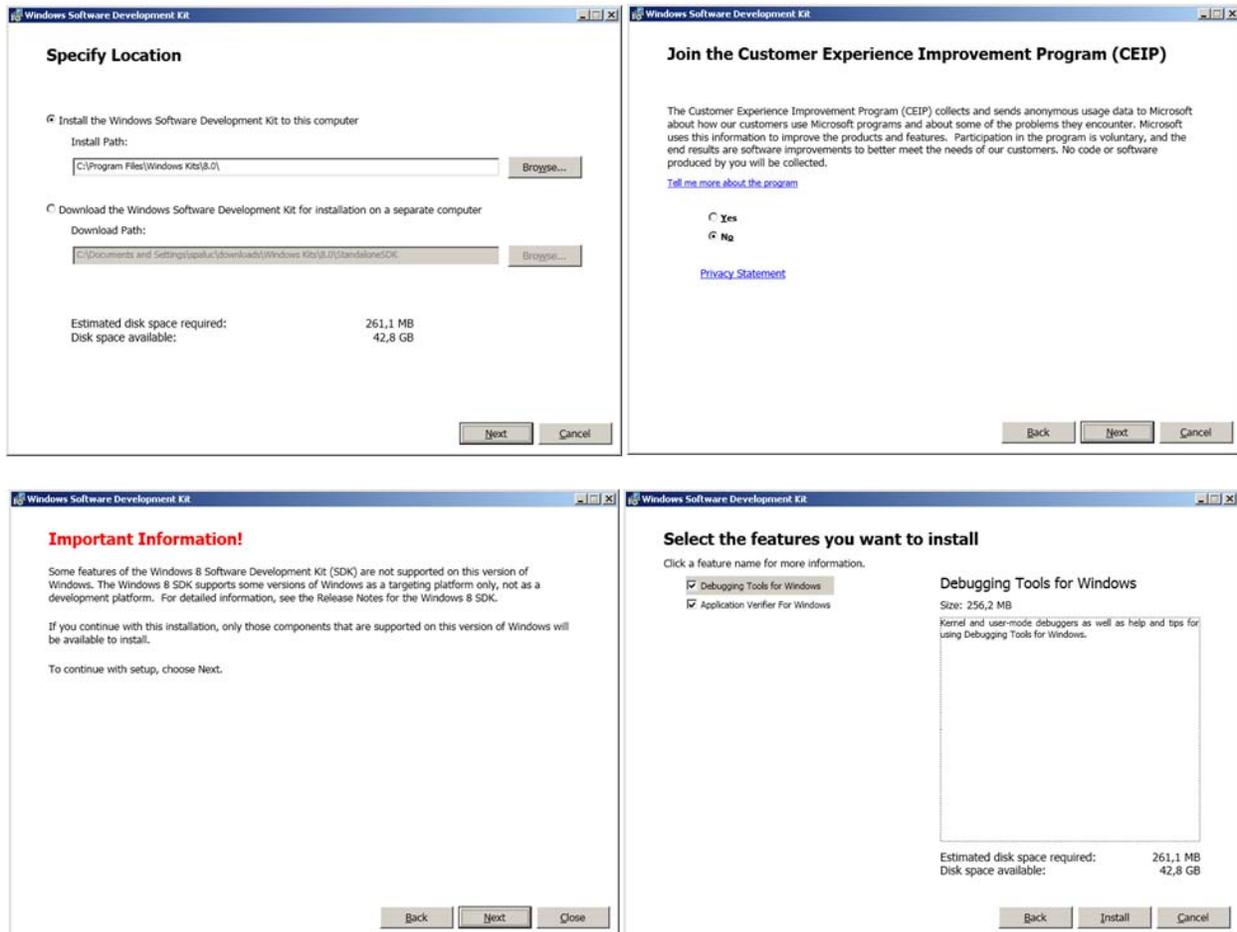


Figure 2-11. Debugger Installation Steps

Update Kit configuration in Qt Creator and specify newly installed debugger.



Debugger is setup. Once a project is open, it would be possible to switch to “*Debug*” view (see Figure 2-13.) and start debugging by “*Debug->Start Debugging->Start Debugging*”, F5 or second from bottom icon on left side menu.

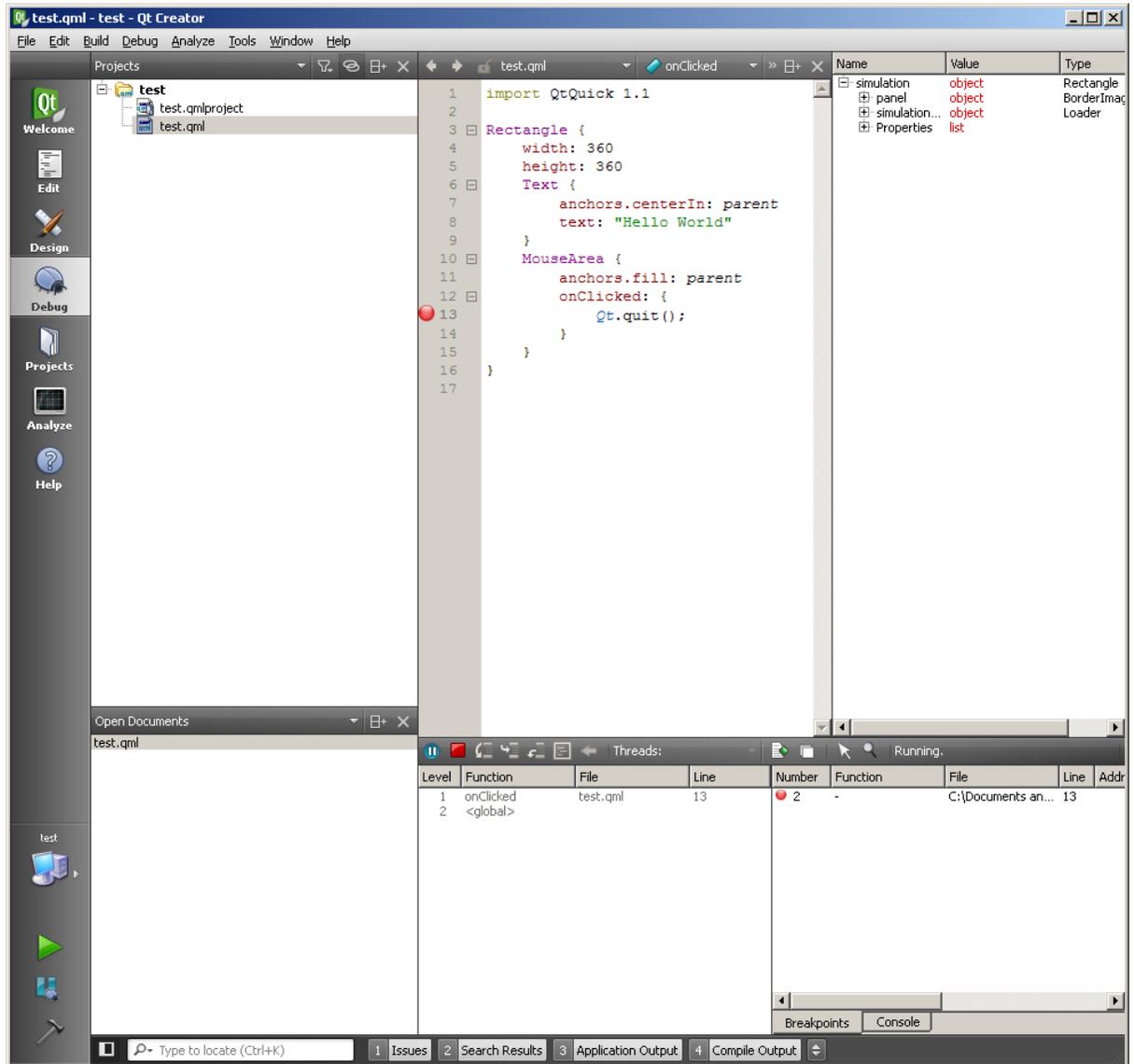


Figure 2-13. Debug View

## Graphics Drivers

Due to the wide range of graphic adapters available on the market, driver versions, virtualization and remote connection methods, issues with proper operation may occur.

This is due to the fact that some parts of Qt Creator use Qt Quick 2, which relies on OpenGL 2.1 (or higher) API for faster drawing. Mostly in the Welcome mode, but it's also used for the Qt Quick Designer, and the QML Profiler.

The use of OpenGL can cause problems, especially in virtual machines, using remote connections and with outdated drivers. In such cases Qt Creator tries to failover to a backup driver and use ANGLE/DirectX. Mostly, this failover is unnoticeable for the user and solves all the problems.

In rare cases, the failover does not act properly and, as a result, Qt Creator shows only blank window, Qt Quick Designer has no styles or has blank sections.

When any of the mentioned issues occur, try:

1. Update graphics drivers. Obtain latest version from the vendor support.
2. Make sure the system is using 32bit color depth.
3. For virtual machines, try to enable 3D acceleration in your virtual machine's settings and install latest Guest Addons.
4. Manually instruct Qt Creator to use desired driver by setting QT\_OPENGL system environment variable:
  - a. `QT_OPENGL=desktop` - to use system OpenGL 2.1 or newer
  - b. `QT_OPENGL=angle` - to failover to ANGLE and DirectX 9 or newer.

Restart to apply changes.

# Chapter 3.

## CIS Overview and Project Creation

This chapter contains an overview of the CIS Kit and instructions for starting new projects.

### CIS Overview

The CIS tool Welcome screen is shown below.

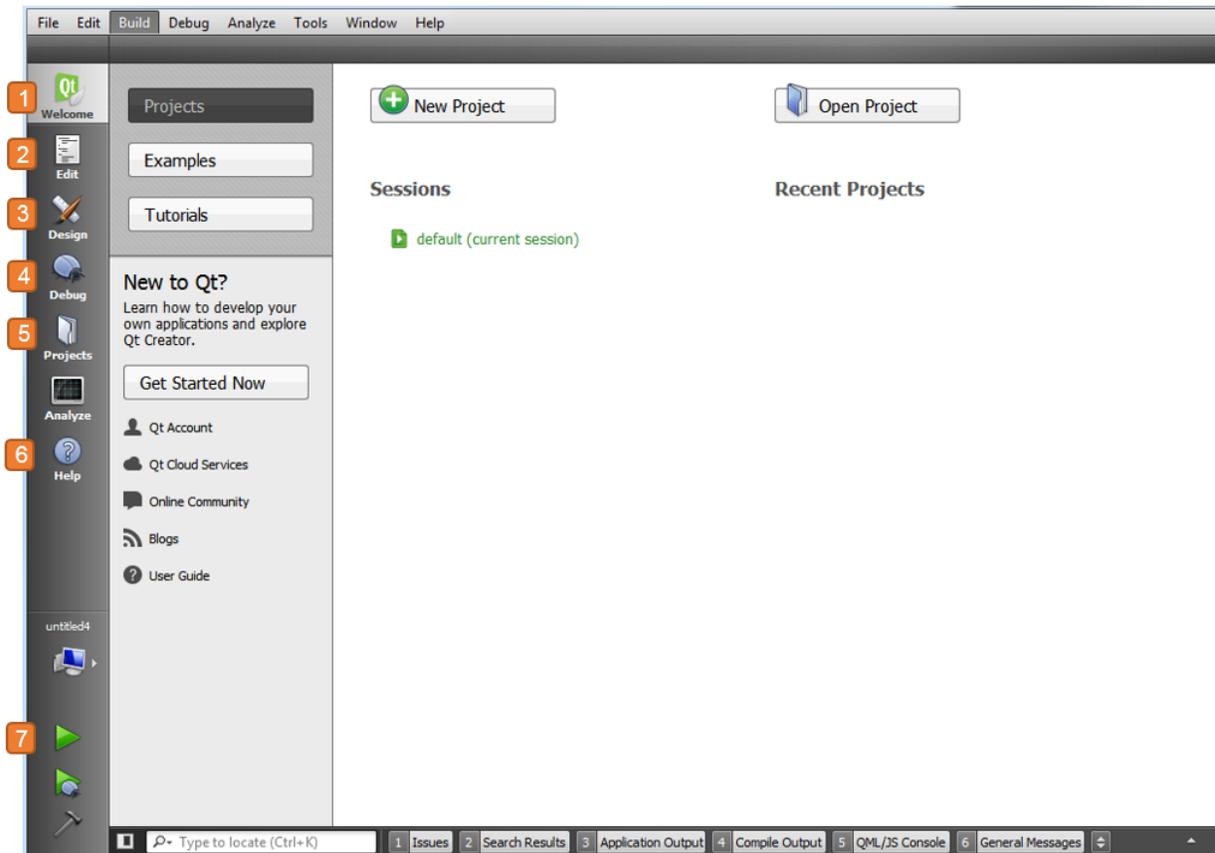


Figure 3-1. CIS Tool Welcome Screen

The functions of the navigation menu on the left are described as follows:

1. **Welcome** – this menu is where new GUI application projects can be started or recent/existing projects can be opened
2. **Edit Mode** – A text editor for GUI pages. This code is auto generated from Design Mode and can be modified here.
3. **Design Mode** – Where individual pages are designed in the visual editor
4. **Debug** – Inspect the state of the application while running
5. **Projects** – Setup the PC Simulation of the GUI project
6. **Help** – Contains help files for Woodward projects and generic Qt tutorials
7. **Run** – Once a Project has been setup, the Run button will launch a PC simulation of the GUI application

## Project Creation

To start a new project, go to the Welcome Menu and select “New Project”. The CIS kit includes Woodward Template applications. The template applications can be used as a starting point for developing new applications.

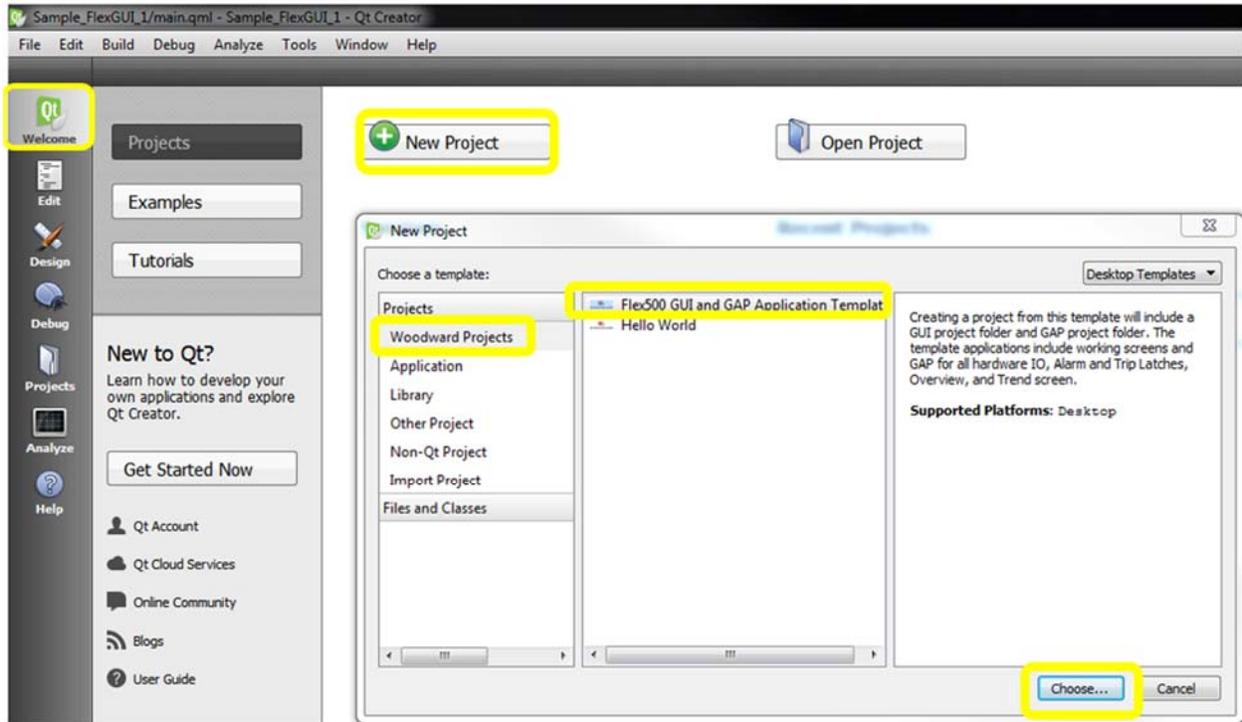
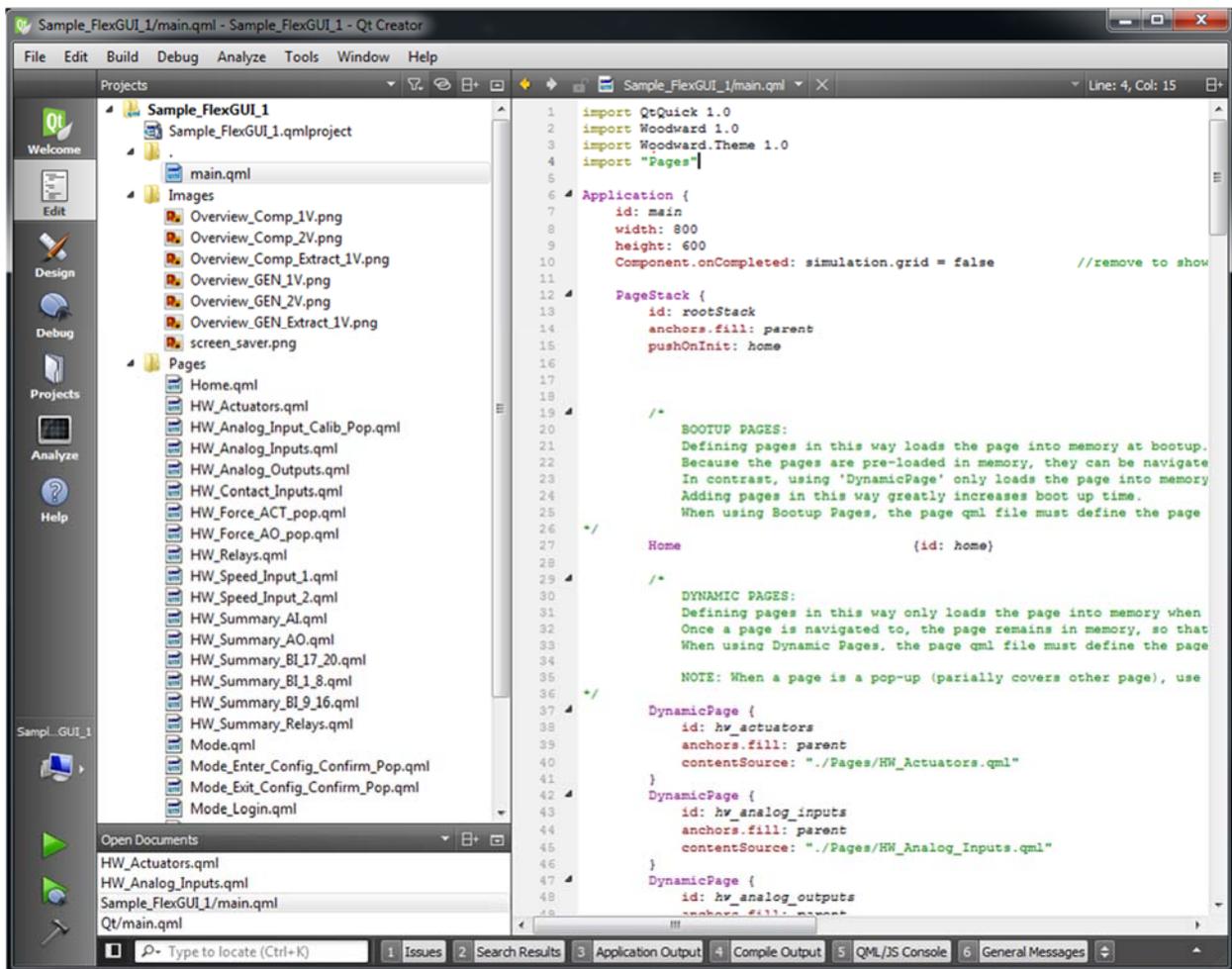


Figure 3-2. Welcome Menu

Once a project has been opened, going to Edit Mode shows the overall project structure, shown below. A Woodward GUI application consists of the following files:

1. main.qml
2. Images (if used)
3. Pages (\*.qml files)
4. Custom Components (if used, \*.qml files)



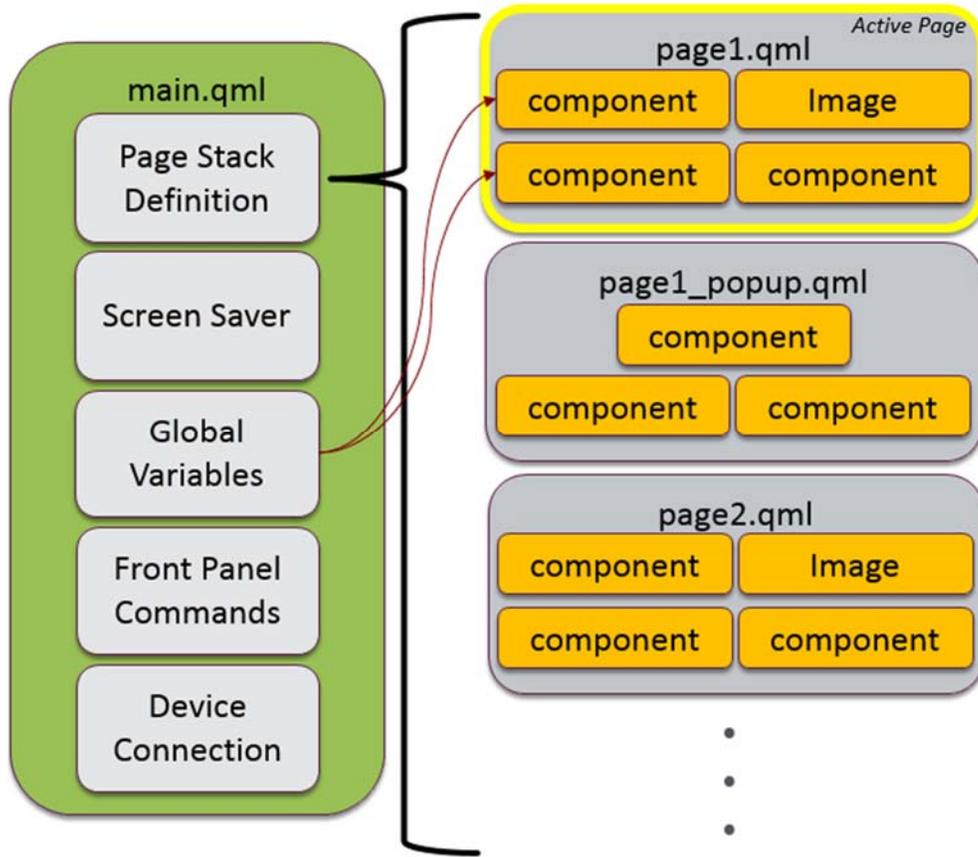


Figure 3-4. main.qml File Contents

To setup the project for PC Simulation, go to the Projects Menu and select Run (circled in Red below). Under the Run section (circled in Green below), press “Add” and select “Custom Executable” from the dropdown menu.

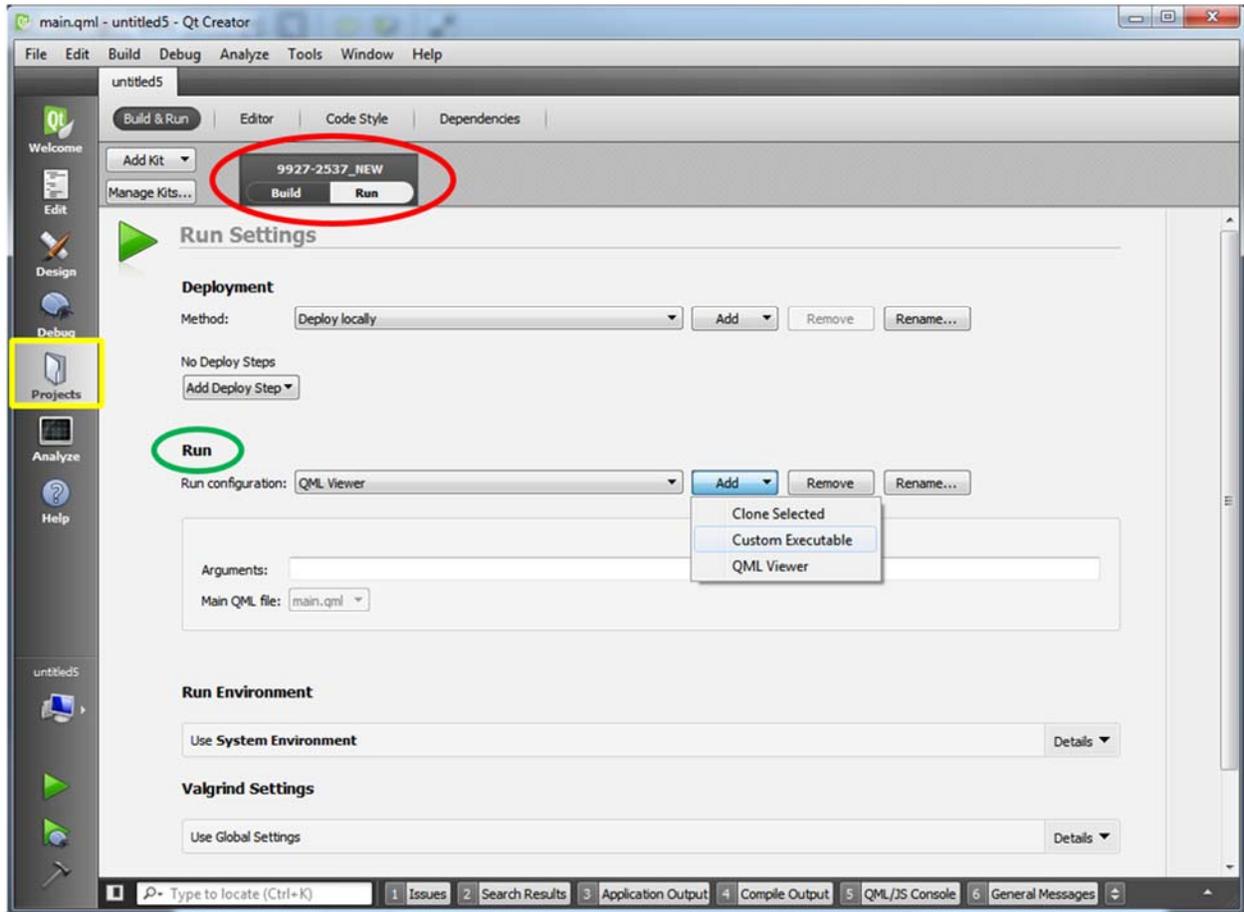


Figure 3-5. PC Simulation Projects Menu

In the fields that appear for the Custom Executable, set the following:

Executable – Select 'Browse' or paste in the following path:

`C:\WcQt\Qt\9927-2537_NEW\bin\qmlcontrolsimulator.exe`

Arguments:

`-p 505 -s 1 main.qml`

Working Directory:

`%{sourceDir}`

Once setup, the Run button in the left menu will launch the PC simulation of the GUI application. It is good to use the PC simulation often to verify development is working properly.

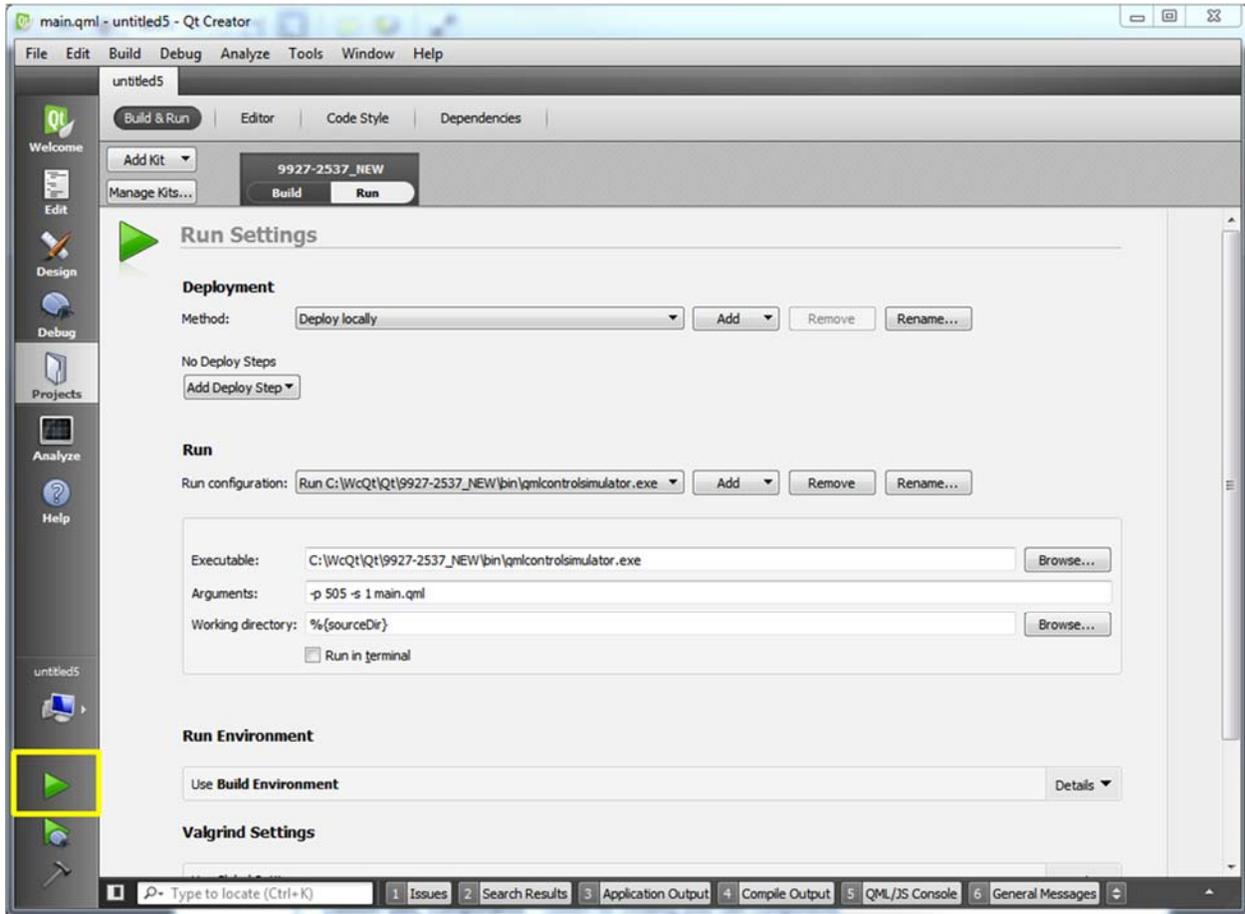


Figure 3-6. PC Simulation Run Button

## Using the Help Files for Project Development

The CIS Kit has project development help files embedded in the help system of the tool. The help menu can be accessed from the left menu and going to “Control Interface Studio Library Kit Manual”. The manual consists of the following menus which can be used to guide your development.

1. **Getting Started** - Guides on project setup and design tool
2. **Qt and QML Basics** - Links to generic Qt development topics
3. **Woodward Concepts** - Guides on GUI structure and device connection
4. **Custom QML Components** - Guides for creating your own components
5. **Tutorials** - Woodward guides for programming GUI tasks
6. **Getting Help** - Additional links to Qt topics

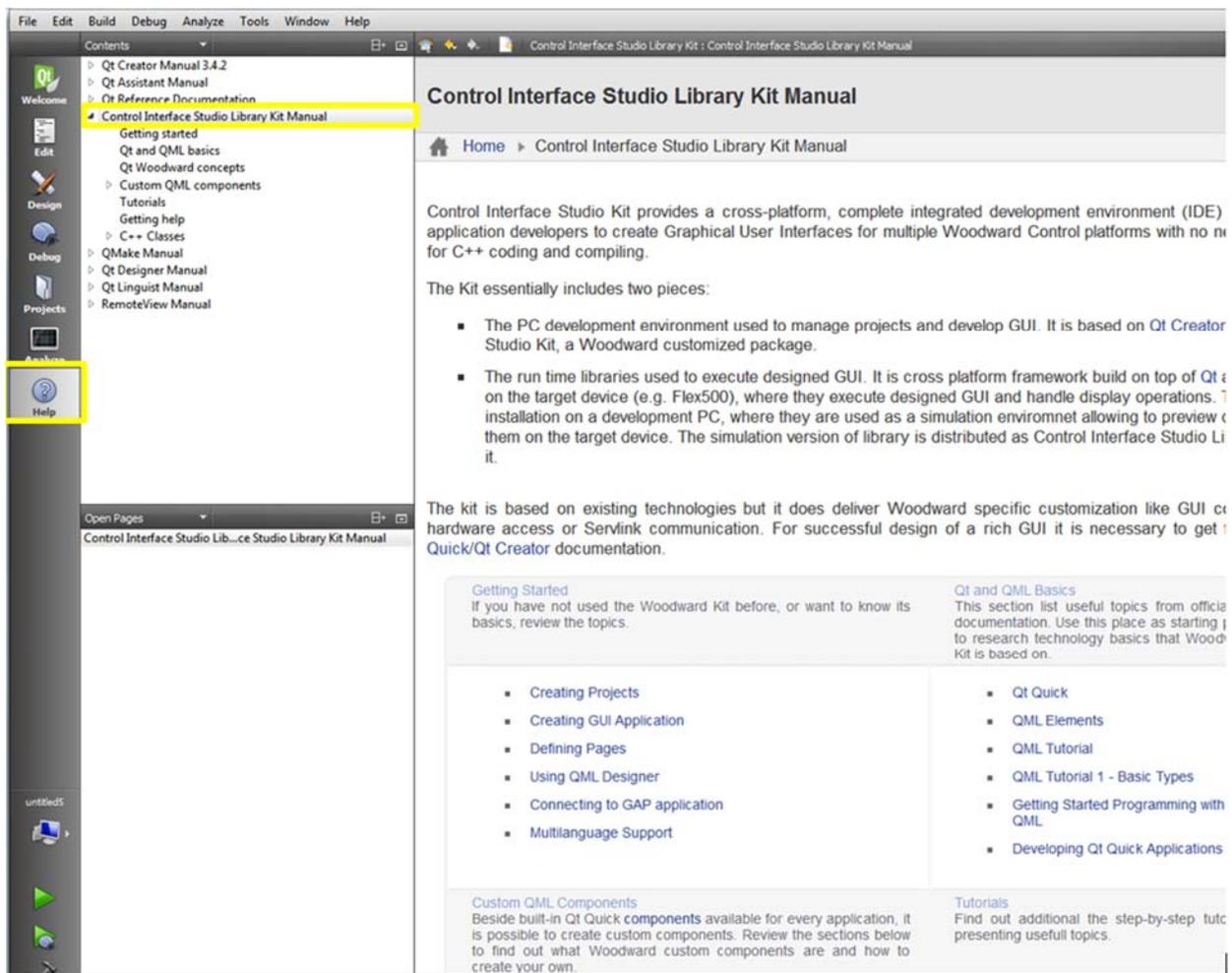


Figure 3-7. CIS Library Kit Manual

## Chapter 4. Setting up Hardware

Control Interface Studio Library Kit is a set of features (and tools) compiled for both the target device and a PC where development happens. This section describes installation of a Flex500 target version of the library. Installed package includes all necessary libraries, add-ons, and QML Control Application.

### Service Packs

When making updates to the footprint of a Flex500, service pack updates are created. Check the Woodward site for service packs updates.

Using AppManager, new service packs can be installed as follows:

1. On your PC, open AppManager.exe.
2. You should see the Woodward control's Computer Name in the AppManager window. Select the control's Computer Name. If the control name is not listed, check your connections and verify that the Link lights are on.
3. Login to the Control with a valid Account name and password which has "Execute control Service Pack" permission.
4. Click "Control" in the top header of the AppManager window, use the pull down menu, and select "Install Service Pack...".

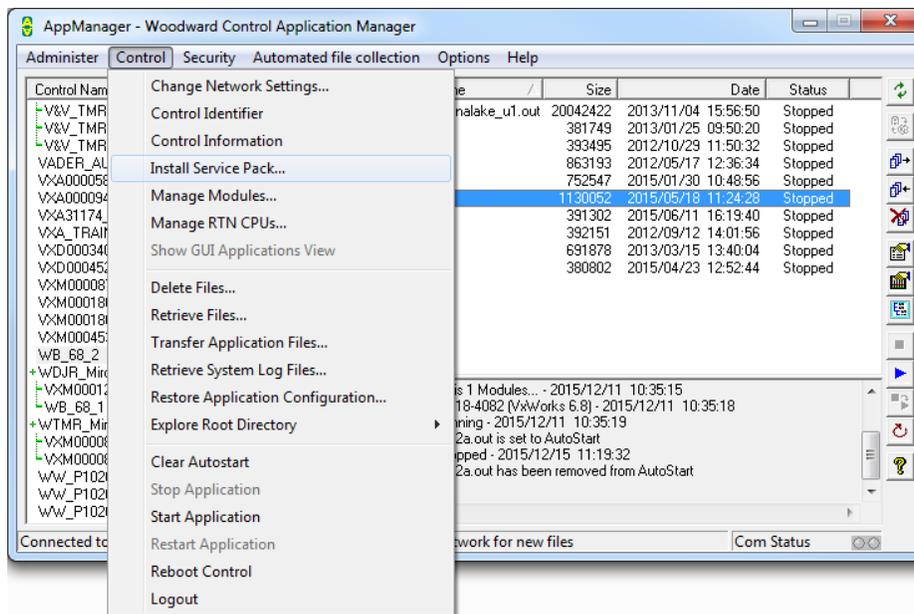


Figure 4-1. AppManager Window, Control Pull Down Menu

- 5. Read the license agreement and select YES if you agree. If you select NO, AppManager will not install the Service Pack.



Figure 4-2. License Agreement Page

- 6. Explore to the service pack downloaded from the Woodward web site and click install.

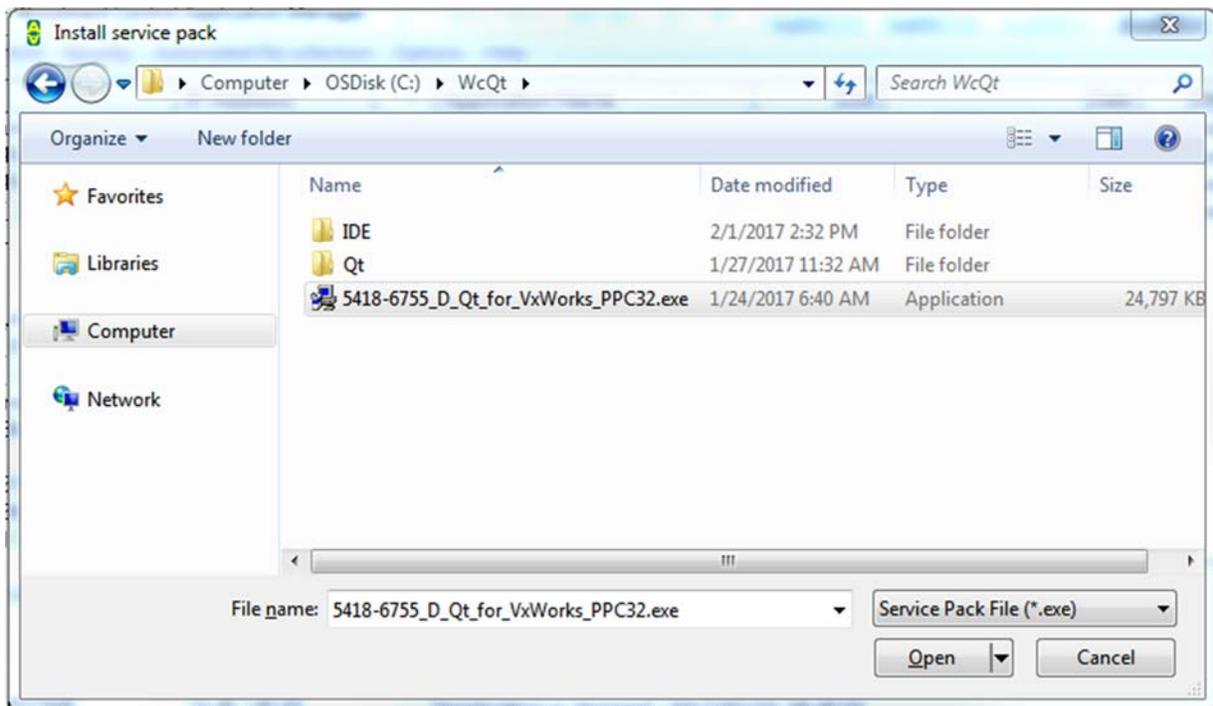


Figure 4-3. Service Pack File Directory

- AppManager will install the new service pack on the selected CPU. This will take some time, and AppManager will report progress as files are transferred. When AppManager is finished transferring files, it will suggest a reboot. When the CPU reboots, the new service pack will be installed.
- Confirm the new service pack is installed by checking the current revision of the footprint by using AppManager Control->Control Information screen.

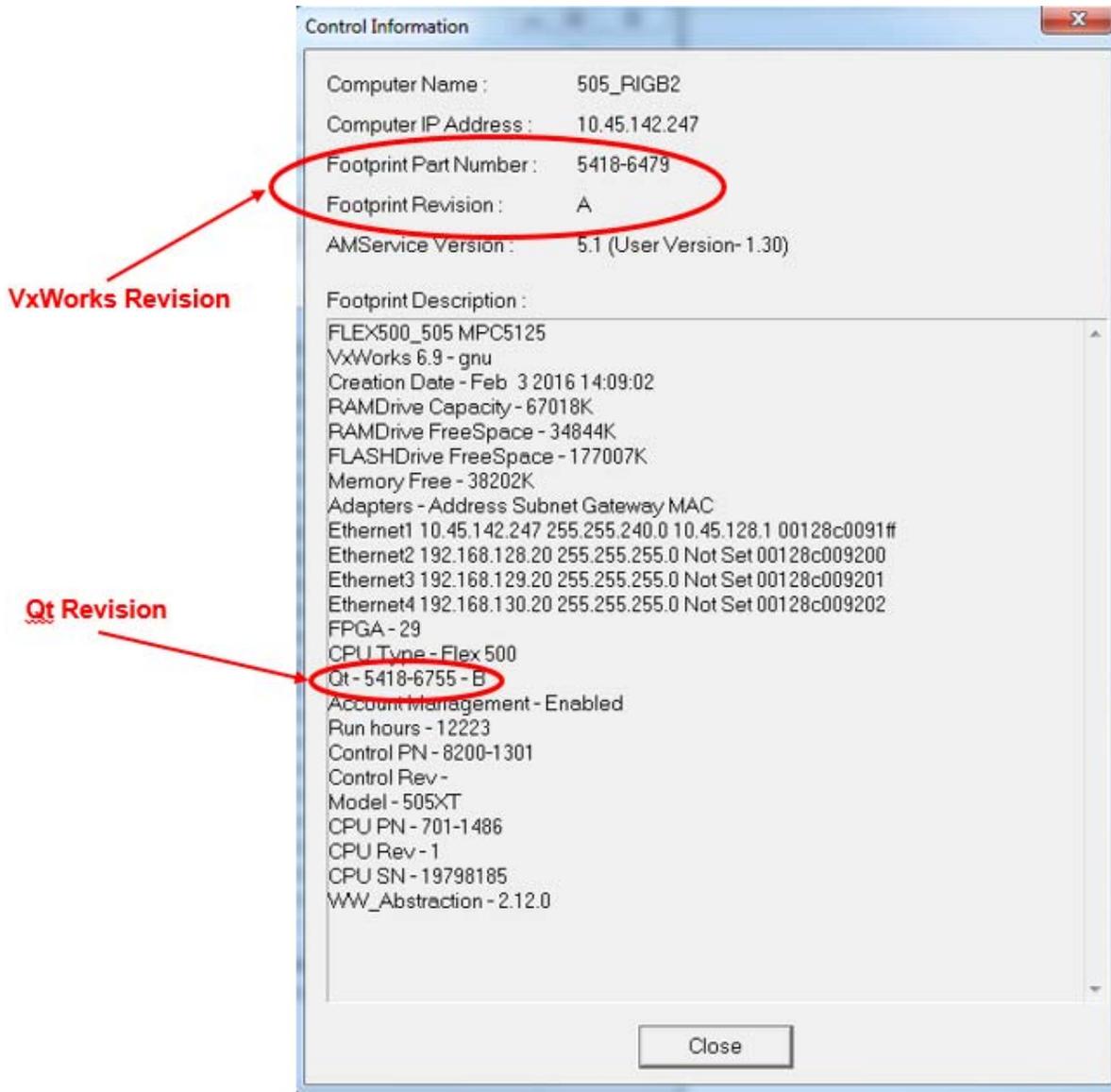


Figure 4-4. AppManager Control Information Screen

---

# Revision History

---

New Manual—

-

We appreciate your comments about the content of our publications.

Send comments to: [icinfo@woodward.com](mailto:icinfo@woodward.com)

Please reference publication **35075**.



B 3 5 0 7 5 : N E W



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](http://www.woodward.com)

Woodward has company-owned plants, subsidiaries, and branches, as well as authorized distributors and other authorized service and sales facilities throughout the world.

Complete address / phone / fax / email information for all locations is available on our website.