

QC-PLC

Real-Time Data Collection from PLCs

QC-PLC®
Training
Manual & Workbook
Version 3.3.1+

Notices

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Table of Contents

1. INTRODUCTION	1
1.1 WHAT IS THE DATA SOURCE	1
1.2 WHAT IF I DON'T HAVE A NETWORK	1
2. SETUP	1
2.1 HOW DO I GET A COPY OF QC-PLC/QC-CALC	1
3. THE BASICS	1
3.1 THE MAIN SCREEN LAYOUT	2
3.2 LICENSING QC-PLC	2
3.3 CONNECTING TO YOUR PLCs	3
3.3.1 Allen Bradley CompactLogix/ControlLogix	3
3.3.2 Supported PLCs	3
3.3.3 Allen Bradley MicroLogix/PLC-5	4
3.3.4 Supported PLCs	4
GE Fanuc PLCs	5
3.3.5 Supported PLCs	5
3.3.6 Modbus PLCs	6
3.3.7 Supported PLCs	6
3.3.8 Siemens PLCs	7
3.3.9 Supported PLCs	7
3.4 TESTING YOUR CONNECTION	8
3.5 WHY DATA TYPES?	9
4. SETTING UP YOUR FIRST SPEC PLAN	10
4.1 WELCOME SCREEN	10
4.2 FACTORS SCREEN	11
4.3 FEATURES SCREEN	12
4.4 SCHEDULE SCREEN	13
4.5 FINISH	14
5. LIVE MONITORING SCREENS	15
5.1 SETTING UP MONITORING	15
5.2 CHANGING GRAPH TYPE	15
6. PLCDATASERVICE	17
7. SETTING YOUR PREFERENCES	18
7.1 PREFERENCES	18
7.1.1 General	18
7.1.2 Set Paths	19
7.1.3 Email Settings	19
7.1.4 Notifications	21
7.1.5 Service Settings	21
8. FILE TAB	22
8.1 PAUSE DATA COLLECTION	22
8.2 ABOUT	22
8.2.1 Run Update	23
8.2.2 Gather Info	23
8.3 LICENSE CONFIG	24
8.3.1 Description	24
8.3.2 Obtaining a License from ProLink	24
8.3.3 Activating QC-PLC	24
8.3.4 Kill License	24

Table of Contents

8.4 SETTINGS.....	25
9. APPENDIX A	26
9.1 A WORD ABOUT WINDOWS SERVICES.....	26
9.1.1 QC-PLC Client vs. PLCDataService.....	26
9.1.1 Login Permissions	27
9.1.2 Mapped Paths/Drive Letters Illegal for Services.....	27

1. Introduction

QC-PLC is a combination Windows application/service that provides a fast and easy method of reading data from programmable logic controllers (PLCs) for data collection in QC-CALC Real-Time. It has been written to work with roughly 90-95% of Ethernet connected PLCs on the market. QC-PLC is a client application that typically resides on a central server at each plant and is responsible for reading data from the registers of your PLCs at regular intervals. The data is organized into specification plans (or spec plans) with nominals and tolerances much like QC-Gage. QC-Gage is a separate windows program used to read data from hand gages. The main difference between QC-PLC and QC-Gage is that in QC-PLC the data is read automatically on a timed schedule or based on an event such as the value of a register changing. The results are then sent to QC-CALC Real-Time for data collection.

1.1 What is the Data Source

Currently, the sources of inspection data are the programmable logic controllers (PLCs) on your shop floor.

1.2 What If I Don't Have a Network

A network is typically required to successfully run QC-PLC in your plant. The only other option would be to put both QC-PLC and QC-CALC Real-Time on the same PC.

2. Setup

QC-PLC is distributed via the Internet and must be installed in your Windows PC or server using a standard SETUP.EXE style program. Perform the following steps:

1. Install QC-PLC on the computer that will do the data collection by double clicking the setup executable and following the wizard prompts. If you simply accept the default settings, it will set itself up normally.
2. Install QC-CALC Real-Time on the same PC following its installation wizard. Again, taking the defaults is recommended.
3. You are now ready to begin using QC-PLC.

2.1 How Do I Get a Copy of QC-PLC/QC-CALC

If you do not own copies of QC-PLC and/or QC-CALC you can download both for free and try them for 30-days. Visit the **Downloads** page of our website at www.ProlinkSoftware.com/download.

If you have a Prolink account you must login to download. If you do not have an account, you can create one instantly by entering some basic information about yourself including an email address and password.

3. The Basics

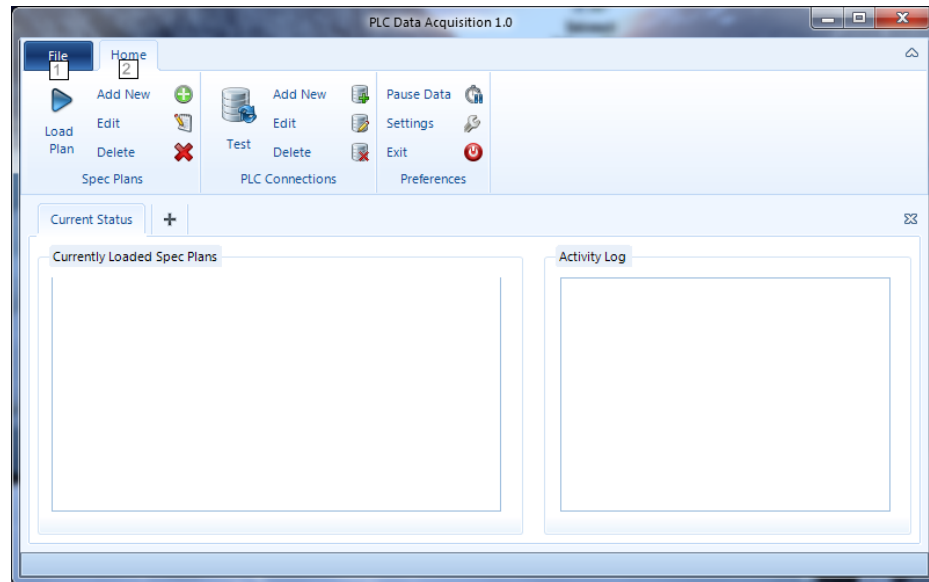
Before getting into the details about this software product, let's quickly cover the basics. Double click the QC-PLC icon on your desktop to start the QC-PLC Client.

PLC Connections

On first launch the main screen is opened for you so you can see **Currently Loaded Spec Plans** and the **Activity Log**. When you first run QC-PLC, you won't have any spec plans loaded so the main grid will be empty.

3.1 The Main Screen Layout

The main screen uses a ribbon style layout that is based on the ribbon control in Microsoft Office 2010. If you are familiar with Office, then this interface should be easy to learn.



At the top are two tabs; **File** and **Home**. The **File** tab opens a list of options that help you license, troubleshoot, and update the application. See [File](#) on page [22](#) for details. The **Home** tab contains all the most commonly used functionality of the application broken into logical groupings of buttons. The button groups are:

Spec Plans

Allows you to add, edit and delete spec plans. In addition, the **Load Plan** button allows you to activate an existing spec plan to begin collecting data. By default, spec plans are not loaded. This allows you to control which plans will collect data at any given time. See [Setting Up Your First Spec Plan](#) on page [10](#) for details.

PLC Connections

Allows you to add, edit, and delete connections to your PLCs. In addition, the large Test Connection button allows you to quickly test a connection (connect to the actual PLC to see if it is online). See [Connecting To Your PLCs](#) on page [3](#) for details.

Preferences

This area is used to control the settings of the QC-PLC tool. Buttons include **Pause Data** (to pause data collection entirely), **Settings** which opens the [Preferences](#) screen (page [18](#)), and **Exit** which exits the application.

3.2 Licensing QC-PLC

QC-PLC typically comes with the ability to connect up to 10 PLCs of one type without the need for further licensing. If you need to collect data from more than 10 PLCs and/or have different types of PLCs (i.e. Allen Bradley and Siemens), please purchase the correct number of licenses and libraries to suit your

PLC Connections

individual needs. If you have questions about this, please contact Prolink for assistance and quoting.

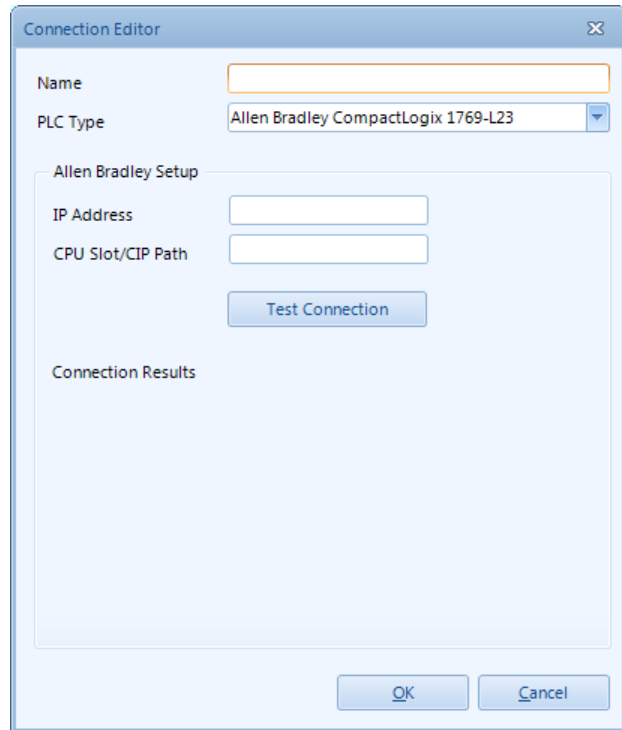
3.3 Connecting To Your PLCs

The first thing you need to do to begin collecting data is to connect to your PLCs. Even though data is collected through spec plans, you first must create a re-usable set of connections so your spec plans can use them when retrieving data from your PLCs. This way, you can have multiple spec plans collecting data from the same PLC without having to reconnect each time. In addition, your spec plans can collect data from multiple PLCs simultaneously so this allows for greater data collection flexibility.



To create a new connection, click the **Add New** button in the **PLC Connections** grouping on the ribbon control. A screen like the one to the right appears.

At the top of the screen, name your connection something familiar that you will remember later and choose the type of PLC from the **PLC Type** list. Since each type of PLC has different settings, the next few sections will detail the individual screens and settings you will see based on the type of PLC you choose.



3.3.1 Allen Bradley CompactLogix/ControlLogix

The Allen Bradley CompactLogix/ControlLogix interface is fairly straightforward. Simply enter the IP address of the PLC and the CPU Slot/CIP Path.

The CPU Slot is often 0 or 1; you may want to try that as a default. To test your connection, click the **Test Connection** button. QC-PLC will attempt to contact the PLC and will display a message telling you whether or not it was successful. If not successful, make sure your settings are correct and that your PLC is online before proceeding. Otherwise, your spec plans cannot collect data.

3.3.2 Supported PLCs

ControlLogix		CompactLogix
1756-L55M12	1756-L61	1769-L23
1756-L55M22	1756-L64	1769-L32
1756-L625	1756-L55M15	1769-L35
1756-L55M13	1756-L615	1768-L43
1756-L55M24	1756-LM60M03SEv	1768-L45

PLC Connections

1756-L63
1756-L55M14

1756-L55M16
1756-L62

SoftLogix
5800

3.3.3 Allen Bradley MicroLogix/PLC-5

The Allen Bradley MicroLogix interface has a couple settings based on the settings of your individual PLC. Simply enter the IP address of the PLC and then specify the Ethernet and Controller options. The most common options are specified in the picture below. You can try different combinations if you have troubles connecting with the defaults.

The screenshot shows the 'Connection Editor' dialog box. It has a title bar with a close button. The 'Name' field is empty. The 'PLC Type' dropdown is set to 'Allen Bradley MicroLogix 1100'. Under 'Allen Bradley Setup', the 'IP Address' field is empty. Under 'Ethernet Setup', the 'ENETIP' radio button is selected. Under 'Controller Setup', the 'PLC-5' radio button is selected. There is a 'Test Connection' button. At the bottom, there are 'OK' and 'Cancel' buttons. The 'Test Results' section shows 'Not attempted'.

3.3.4 Supported PLCs

MicroLogix 1100 & 1400

1763-L16 (all series)
1766-L32 (all series)

MicroLogix 1000, 1200, & 1500

1761-L10
1761-L161
1761-L32 (all series)
1762-L24
1762-L40 (all series)
1764-24
1764-L28 (all series)

SLC-5/05

1747-L551
1747-L552
1747-L5532

SLC-5/04

1747-L541
1747-L542
1747-L543

SLC-5/03

1747-L531
1747-L532
1747-L

PLC-5/11

1785-L11B

PLC-5/20, 5/20E, & 5/20C

1785-L20B
1785-L20E
1785-L20C15

PLC-5/26

1785-L26B

PLC-5/30

1785-L30B

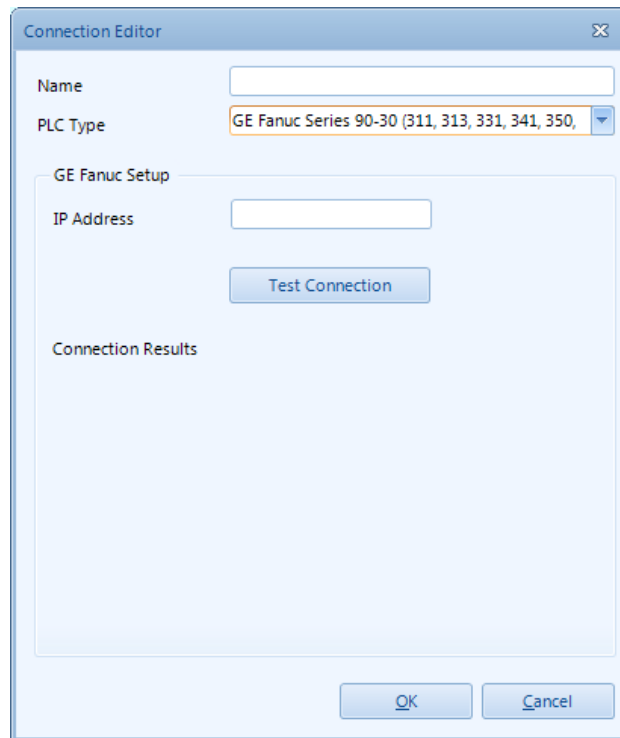
PLC-5/40, 5/40E, 5/40L, & 5/40C

1785-L40B
1785-L40E
1785-L40L
1785-L40C15

PLC Connections

GE Fanuc PLCs

The GE Fanuc interface is the simplest of all. Simply enter the IP Address of the PLC and it will connect. Click **Test Connection** to test the connection.



3.3.5 Supported PLCs

PACSystem RX3I

PACSystem RX7I

Versamax Micro, Nano and Modular PLC's

Series 90-30 311, 313, 331, 341, 350, 360 or higher

Series 90-70 731, 732m 771, 772, 781, 782 or higher

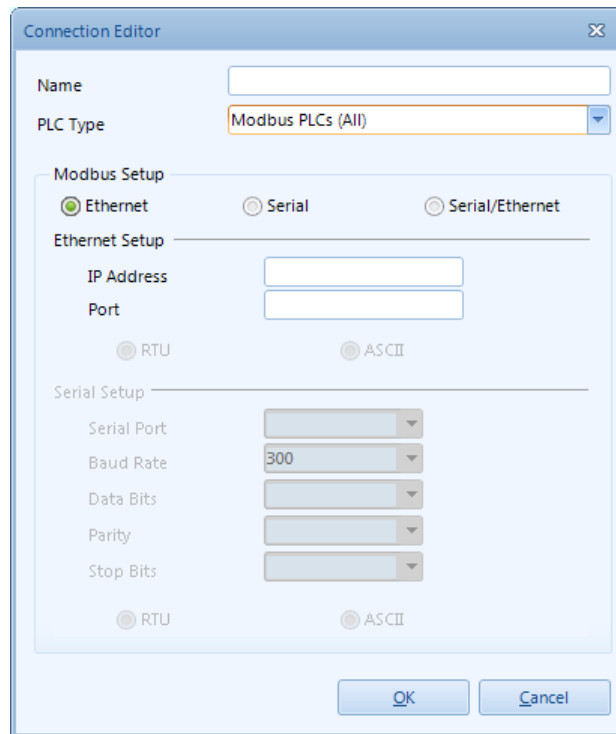
Horner OCS (Operator Control Stations)

PLC Connections

3.3.6 Modbus PLCs

The Modbus interface supports Ethernet, Serial and Serial over Ethernet devices. For Ethernet, simply enter the IP Address of the PLC and the port number. The port number is most commonly set to 502, but can be set to whatever you choose.

If your Modbus PLC is set to serial, you must fill out the **Serial Setup** area including the Serial/COM port, baud rate, data bits, parity, and stop bits. Your Modbus manual should have this information.



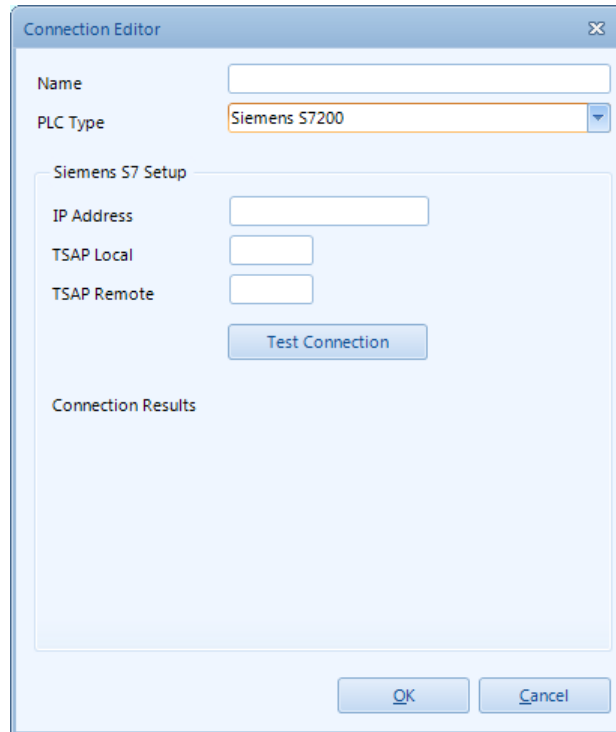
3.3.7 Supported PLCs

All Modbus PLCs

PLC Connections

3.3.8 Siemens PLCs

The Siemens PLCs vary slightly based on version, but will look like the picture below. Enter the IP Address and then either the TSAP Local/Remote values (S7200 series only) or the Rack and CPU Slot values (S7300, S7400, S71200 series).



3.3.9 Supported PLCs

Siemens S7-200 via CP243

Siemens S7-300 via CP343

Siemens ET 200 via built in Ethernet ports

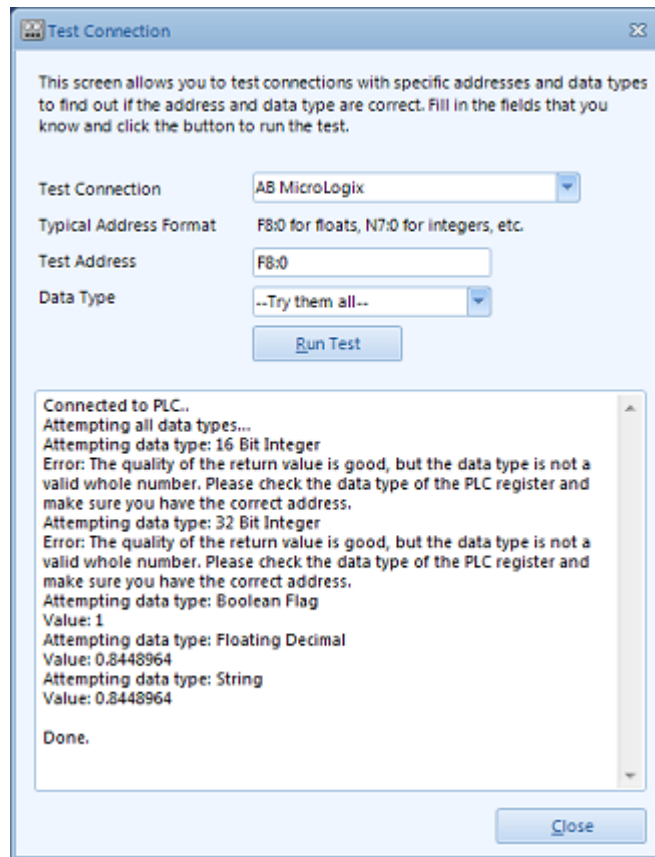
Siemens S7-400 via CP443

Siemens S7-1200 via built in Ethernet module

3.4 Testing Your Connection

There are multiple ways to test the connections to your PLCs. During the connection creation process above, most of the PLC types allow you to do a quick test of the connection to make sure your IP address and settings will allow a valid connection. In those cases, the results will be displayed in a special area on the screen.

However, there is a more comprehensive test that can be run that actually allows you to check the values of particular registers on the PLC. To run this test, select the **Test** button in the **Connections** group on the main ribbon bar. The following screen appears.



From this screen, you have a couple options. First, you can simply check the connection by choosing the connection from the drop down list, leaving the other fields blank, and selecting **Run Test**. The screen will only attempt the connection and return the results in the box below.

You can also check individual register values by typing an address into the **Test Address** box. If you know the data type, choose it from the list. Otherwise, leave the setting as “**—Try them all—**” and QC-PLC will attempt each data type in succession. The results will be displayed below.

This can be a convenient way of checking the data type if you do not know how the value is being stored in the PLC. As you can see in the picture above, a floating point decimal address (F8:0) was entered for an Allen Bradley Micrologix PLC. QC-PLC then tried each data type. Some of them returned errors saying they were able to return a value, but that it wasn't a valid integer (whole number).

Toward the bottom of the list, it tried the Floating Decimal and successfully returned 0.8448964. It was also able to convert this value to a valid string of text.

3.5 Why Data Types?

You may notice throughout the screens whenever there is a connection and PLC address, there is also a data type list that you must specify. This is in place because PLCs store different types of numbers and flags in different sized memory locations. If you just specify the address without the data type, QC-PLC knows where to start pulling the data, but not how much data to pull back. As such, we must specify the data type so the PLC knows how much data to send back and load into the value.

There are certain exceptions to this rule based on the type of PLC. In these cases (such as certain Allen Bradley PLCs), the data tables are declared in the PLC to be of a certain type (integer, decimal, string, flag, etc). In these cases, the data type on the screens is ignored since the address of the register already contains the definition of the data type. Since QC-PLC must cover all cases, however, we add the fields and require them to be filled out.

4. Setting Up Your First Spec Plan

Once you have successfully connected to your PLC(s), it is time to create the Specification Plans (**Spec Plans**) that will actually do the data collection. Spec plans have been modeled after the spec plans in QC-Gage to help speed the learning process. The concept is that you can create as many spec plans as you desire. Only those spec plans that are activated are actually collecting data. This gives you the flexibility to activate different sets of spec plans at different times or from different PCs according to your preference. A spec plan is simply a set of measurements and factors (trace fields) representing a part or the process at a point in time. These measurements are gathered from one or more PLCs on some schedule and are sent to QC-CALC Real-Time for data collection. The schedule can either be time based (i.e. every 2 minutes) or event based (i.e. whenever register 12's value changes to 1).

To create a new spec plan, click the **Add New** button in the Spec Plans grouping on the main ribbon bar. A wizard like the one below will appear.



4.1 Welcome Screen

The **Welcome** screen allows you to name your spec plan. The name of the spec plan will automatically become the name of the QCC file created in QC-CALC Real-Time. Select **Next >>** to continue.

A screenshot of the 'Spec Plan Wizard' dialog box. The 'Welcome' tab is selected in the left-hand pane. The main area contains the following text: 'Please specify the name of your spec plan. This name is used as the QC-CALC database name by default. Click Advanced to override the QC-CALC database name or location, or the spec plan location.' Below this is a text box for 'Spec Plan Name' containing 'my test plan'. A link 'Hide Advanced' is visible. Below that are three more text boxes: 'Override QC-CALC Database Name', 'Override QC-CALC Database Path' (with a browse button and a 'Default' button), and 'Override Spec Plan Path' (with a browse button and a 'Default' button). At the bottom, there are buttons for '<< Back', 'Next >>', 'Finish', and 'Cancel'. A red asterisk indicates a required field.

If you click the **Show Advanced** link just below the **Spec Plan Name**, three more fields will appear that allow you to change the way QC-CALC behaves during data collection.

Override QC-CALC Database Name

If you choose, you can override the name QC-CALC will use for its QCC file. If specified, QC-CALC will use the overridden name as the name for the QCC file rather than the name of the spec plan. This allows you to have multiple spec plans sending data to the same QCC file via the multisource feature in QC-CALC.

Override QC-CALC Database Path

Much like the QC-CALC PATHSWITCH feature that works with some CMM software, this allows you to override the path to which QC-CALC saves the QCC file. **NOTE:** This will only work if you have allowed the path to be passed from the

Writing Spec Plans

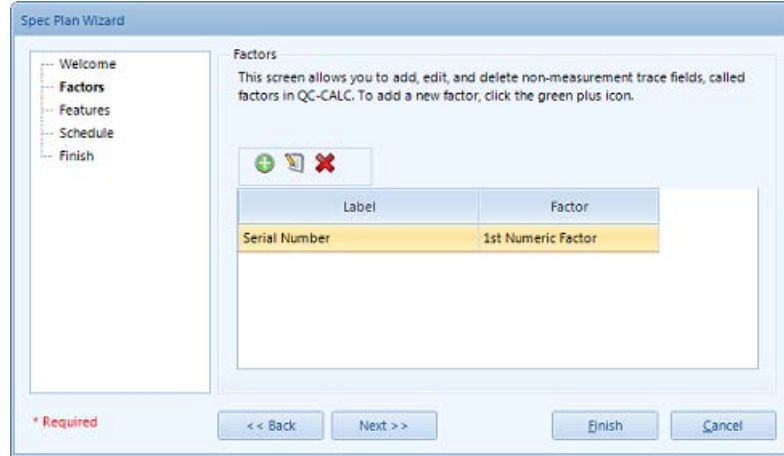
machine in the **Tools – Options – Data Collection – Data Source Information** section of QC-CALC Real-Time.

Override Spec Plan Path

This will override where the spec plan is actually stored. By default, spec plans are stored in the spec plan path in the Settings area.

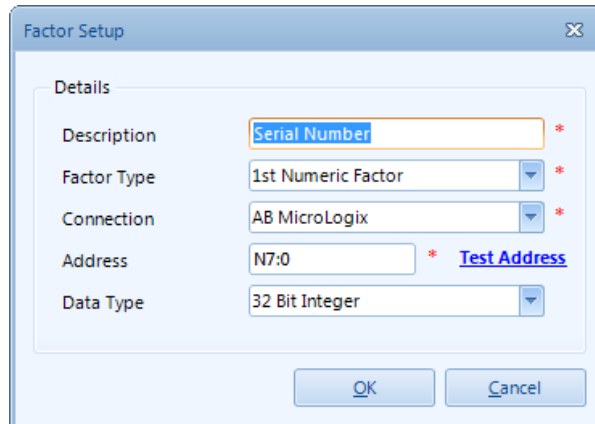
4.2 Factors Screen

This screen allows you to set up factors (trace fields) for your spec plan. You can add up to 30 numeric and 30 text factors per spec plan and each can point to its own register address on any PLC.



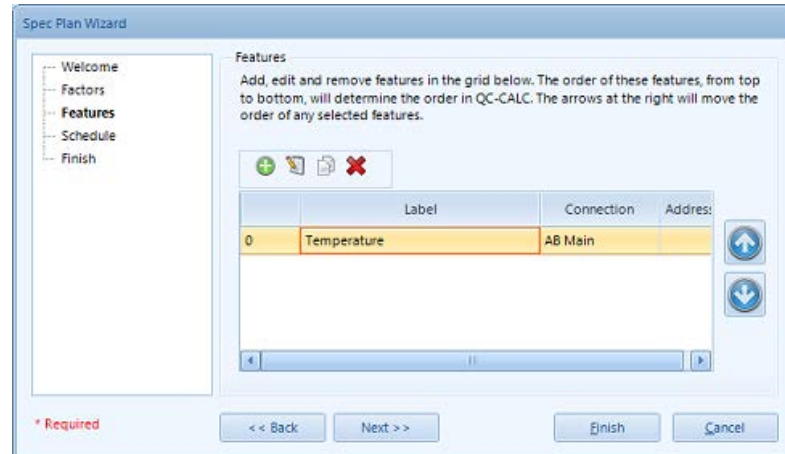
As with most ProLink products, you create, edit and delete factors with the plus, pencil, and “x” buttons above the list. You can also double click on items in the list to edit them.

When adding or editing factors, you will see the **Factor Setup** screen. This allows you to specify a name, choose the type, PLC connection and PLC address. In addition, you should specify the data type since certain PLC types require this. Please keep in mind that because each factor has its own connection setting which means that different factors in your spec plan can come from different PLCs. The **Test Address** link allows you to test the address via the Connection Testing screen. Please see the section above on testing a connection and address.



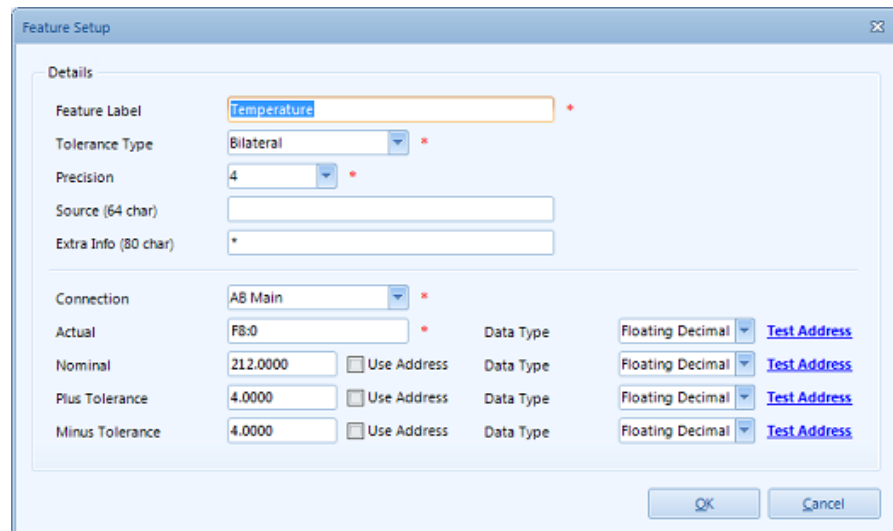
4.3 Features Screen

Like the factors screen, you maintain the list of features you will be collecting on this screen. The list includes the usual add, edit and delete buttons, but also includes a copy button and up/down arrows on the right side of the list for reordering features.



When you add/edit features, you will use the **Feature Setup** screen. On this screen, the feature label, tolerance type, connection, actual (address) and data type are required. For Nominal, Plus Tolerance, and Minus Tolerance, you can either specify a decimal number or an address on the PLC from which the nominal or tolerance should be retrieved.

If you choose to use the nominals from registers on the PLC, specify the address, check the **Use Address** checkbox, and choose the **Data Type**. Typically, the numbers are floating point decimals and are loaded into QC-CALC Real-Time as such.



4.4 Schedule Screen

The schedule screen tells QC-PLC how often the spec plan should collect data from the PLC. There are currently two types of schedules; interval (or time) based and event based.

The screenshot shows the 'Spec Plan Wizard' window with the 'Schedule' step selected in the left-hand navigation pane. The main area contains the following elements:

- Interval Based:** Selected with a radio button. The 'Every' field is set to '5' and the unit is 'Seconds'.
- Event Based:** Unselected with a radio button. Fields for 'Connection', 'Address', 'Data Type', and 'Event' are present but empty.
- Navigation:** '<< Back', 'Next >>', 'Finish', and 'Cancel' buttons are at the bottom.
- Footer:** A red asterisk and the word 'Required' are visible.

Interval Based

This is a fairly simple timer. You simply type a number and choose seconds, minutes, or hours. Whenever the interval has passed, QC-PLC will attempt to collect all data for the spec plan from the PLC.

Event Based

With this type of schedule, you specify a connection, the address of a PLC register, and the data type of the value coming from the register. QC-PLC will then watch the register for a change to the value of the register and trigger the data collection when that event occurs. You can check either that the value “changes to” a particular value you specify or that it “changes” at all.

The screenshot shows the 'Spec Plan Wizard' window with the 'Schedule' step selected. The main area contains the following elements:

- Interval Based:** Unselected with a radio button. The 'Every' field is set to '5' and the unit is 'Minutes'.
- Event Based:** Selected with a radio button. Fields are filled as follows: 'Connection' is 'My First Name', 'Address' is '192.168.1.1', 'Data Type' is 'Floating Decimal', and 'Event' is 'Changes To' with a value of '85.0'.
- Navigation:** '<< Back', 'Next >>', 'Finish', and 'Cancel' buttons are at the bottom.
- Footer:** A red asterisk and the word 'Required' are visible.

In the case of a “changes to” situation, it will only trigger once whenever the value changes to the desired value. For instance, let’s say you have a register with a value of 0 and you want to collect data when the value changes to 1 (typical flag scenario). When the value changes to 1, QC-PLC will collect the data once and will then wait until the value changes to something else before resetting

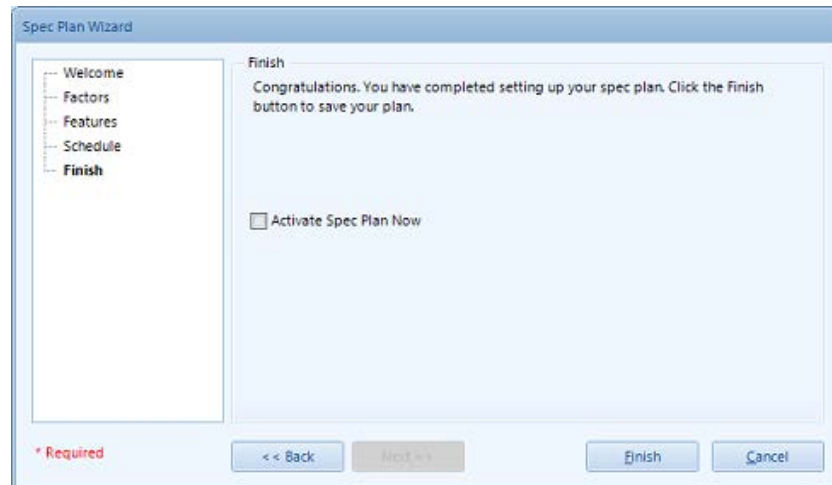
Writing Spec Plans

the trigger. QC-PLC never changes the values of registers on your PLC. This is something you should do in your ladder logic.

The trigger for “changes” is similar to the “changes to” trigger except that the trigger will happen whenever the value changes regardless of what the new value is (but only once per change). Therefore, using the example above with 0 and 1, QC-PLC will trigger when the value changes from 0 to 1. It will then trigger again when you set the value back to 0.

4.5 Finish

This is a typical **Finish** wizard screen. To save your spec plan, select **Finish**. To cancel all changes, select **Cancel**. If you would like to activate the spec plan immediately, check the **Activate Spec Plan Now** option before selecting **Finish**.



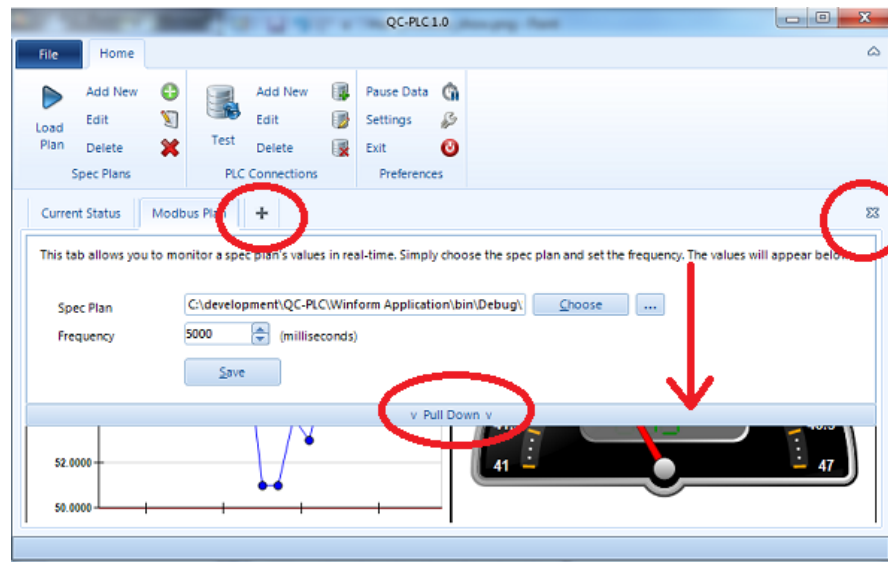
5. Live Monitoring Screens

In addition to data collection, you can choose to put live monitors on your main screen that monitors the addresses of the PLCs. The addresses to monitor are specified by specifying a spec plan to use. Each feature in the spec plan is then displayed as either a radial gauge or continuous line chart.

NOTE: You can monitor any spec plan and not just those are currently active (collecting data). Indeed it may make sense to create certain spec plans for the sole purpose of monitoring without any intention of using the spec plans for data collection. In the case of monitoring the spec plan merely provides a framework to monitor features. The upper and lower tolerance values provide scaling (min/max values) for the monitoring charts.

5.1 Setting Up Monitoring

The main screen is actually a tabbed interface (just below the ribbon bar). To create a monitoring screen, click the plus (+) sign just to the right of the **Current Status** tab. To close a monitoring screen, click the "X" at the far right of the tab. You can close all tabs except the **Current Status** tab. This tab is always present.



Once the new tab has been created, you will see a bar that can be pulled down. Simply move your mouse pointer over the bar and it will pull down revealing the settings for the monitoring screen. The monitoring screen has two settings; the spec plan to monitor and the frequency to update the screen. You can either choose a spec plan from the list by selecting the **Choose** button or navigate to a spec plan at a particular path by selecting the "..." button.

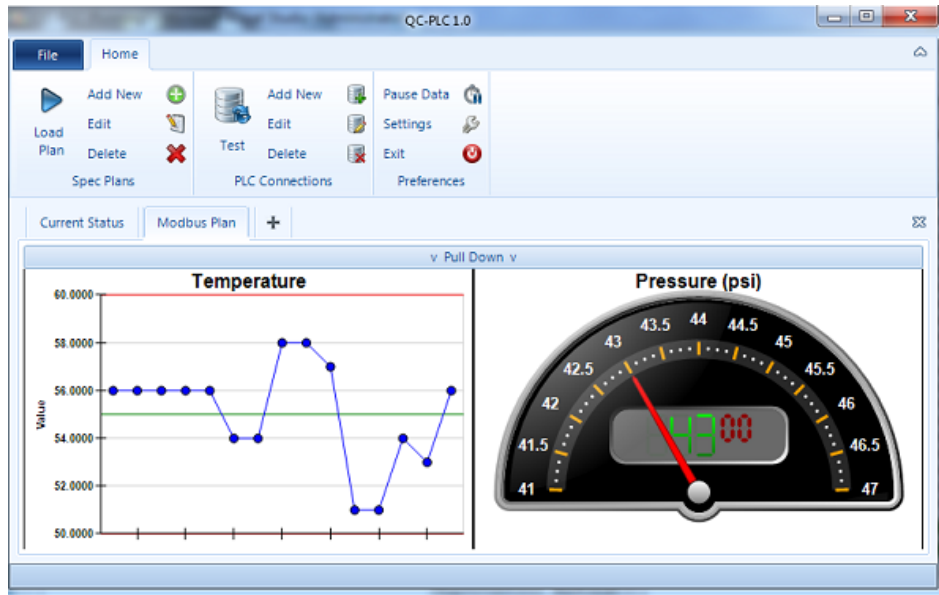
5.2 Changing Graph Type

When you set up the monitoring screen, radial gauges (resembling speedometers) will appear for each feature in the spec plan chosen. The range of data (upper and lower limit) is taken from the upper and lower specs from the features of your spec plan and the meters will refresh at the frequency specified.

If you wish, you can change individual features to a continuous line chart by right clicking on any feature and choosing **Show As Line Graph**. This will change the chart to a line graph that holds the last 25 points.

Live Monitor

All monitoring pages that are on screen are automatically remembered when you close and re-launch QC-PLC.

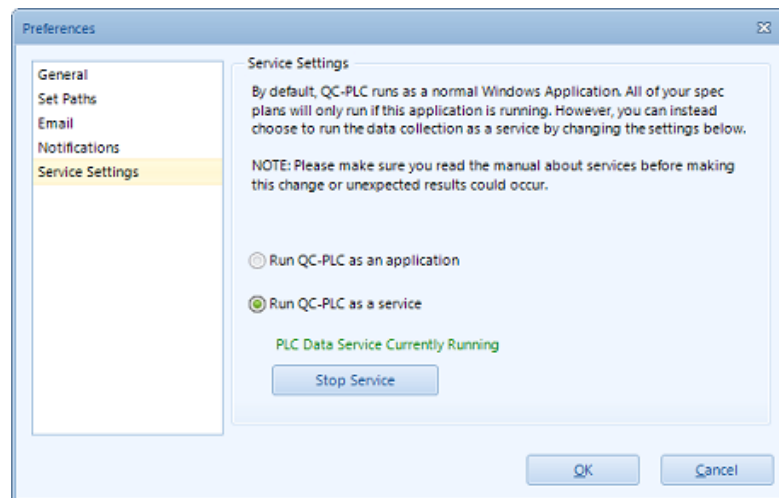


6. PLCDataService

QC-PLC will work normally out of the box and you can begin collecting data immediately. However, you will soon notice that you cannot collect data from your PLCs if you close the application or when the PC is not logged in as a user. This is because by default, QC-PLC runs as an application. However, QC-PLC can also run as a Windows Service and can be changed at any time. When running as a service, it means that QC-PLC will continue to run as long as the PC/Server is powered on even if nobody is logged in. This makes it convenient for IT deployments since IT departments don't typically leave servers logged in permanently.

QC-PLC is defaulted to run as a Windows application so you can collect data immediately without the complication of setting up a Windows Service on first run. In the longer term, it is recommended that you run it as a service in order to ensure data is always collected as expected. Switching the program over to a service is fairly easy and requires only a few clicks. Before doing so, please familiarize yourself with Appendix B: A Word about Windows Services so you understand how services operate in the Windows environment.

Switching QC-PLC to run as a service requires two steps; flipping the flag to run as a service and turning on the service itself. First select the **Settings** button on the main ribbon control. Then click **Service Settings** in the list to the left of the **Preferences** screen.



Choose **Run QC-PLC as a service** and click **Start Service**. Click **OK** to save your changes. To run QC-PLC as an application, return to this screen, choose **Run QC-PLC as an application** and click **OK**.

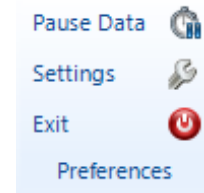
Once QC-PLC is running as a service, your spec plans will continue to run even if you close the main QC-PLC window. As such, you can simply close the application once you have set up your spec plans. This is because the service is a separate application running in the background. The QC-PLC client can run either in the Windows system tray (lower right corner of screen near the clock) or be shut down once events are scheduled and options chosen.

NOTE: Please see [Appendix A](#) – A Word about Windows Services for considerations when running QC-PLC as a Windows Service on page [26](#).

7. Setting your Preferences

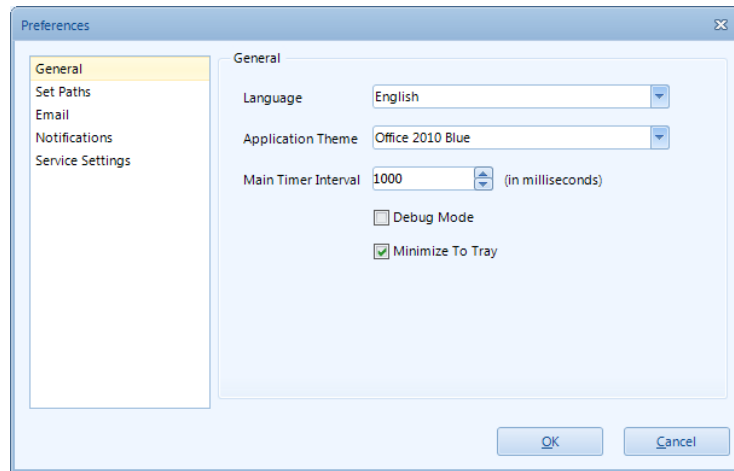
7.1 Preferences

The **Preferences** screen with all the options described below is available by choosing **Settings** in the **File** tab or by clicking the **Settings** button in the **Preferences** area of the **Home** tab.



7.1.1 General

The **General** screen has all the general non-categorized settings listed here:



Language

This identifies the current language being used by QC-PLC for all screens, messages, labels, buttons, etc. in the application. **NOTE:** Debug and Error messages are always in English to help with troubleshooting by Prolink.

Application Theme

This is a visual preference that allows you to use one of a few different themes throughout the application. The default setting for this is Office 2010 Blue. If you change this setting you must restart QC-PLC in order for the new theme to take effect.

Main Timer Interval

This setting tells QC-PLC how often it should check to run active spec plans and refresh the monitoring screens. The units for this setting are milliseconds so 1000 = 1 second. For the most part, you should leave this set to 1000 (or 1 second). This way QC-PLC will check each second whether or not it should run your active spec plans. However, should you want to run it more often, you can decrease this time to a fraction of a second or as high as 10000 (10 seconds).

Debug Mode

If checked, a file is generated called debug.log in the directory where QC-PLC is installed. This log contains detailed information on each activity done by QC-PLC. Generally, you should keep this setting unchecked for performance reasons. However it may help with troubleshooting if you are having troubles and need to see what is happening.

Preferences

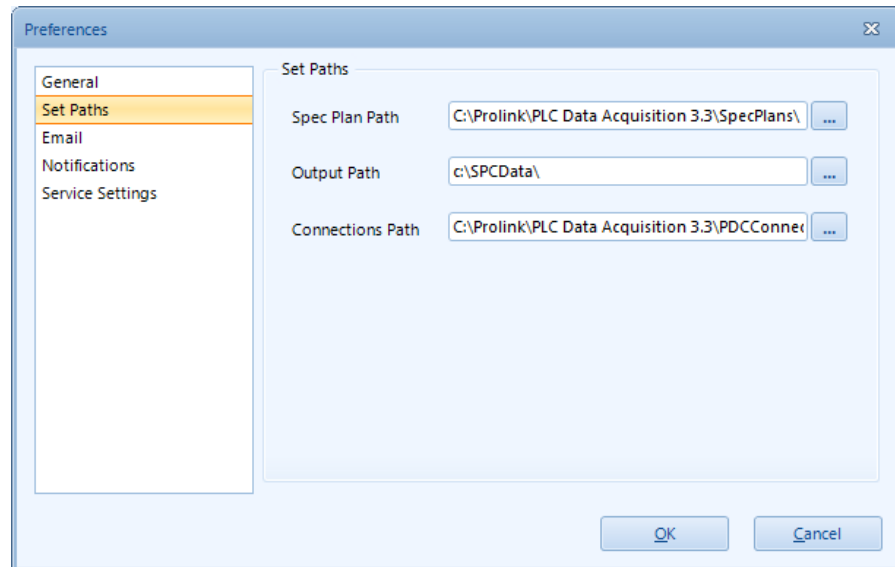
WARNING: This file will get extremely large if this option is checked for long periods of time since QC-PLC is literally logging everything it is doing.

Minimize To Tray

This option changes the behavior of the Minimize button in the top right corner of the window. If checked, the QC-PLC client will minimize itself to the tray of your desktop rather than just the task bar. When minimized to the tray, you can restore it by either right clicking the icon and choosing **Restore** or double clicking the icon.

7.1.2 Set Paths

This screen allows you to set the paths that are relevant to the operation of QC-PLC. To set the file locations, simply enter the path by typing or browse to the folders and file on your local PC or network.



Spec Plan Path

This is the path where all spec plans are stored. These are all separate files that can either be shared on a network or copied from PC to PC. Spec plans have a .plc extension unlike the equivalent spec plans in QC-Gage that have a .spl extension. This was done to prevent confusion.

Output Path

This is the path where QC-PLC will write its output data for QC-CALC. QC-PLC has been set up to act like any other automatic inspection machine/QC-Gage in that it writes a data file each time it runs an inspection. QC-CALC should be set to read this same folder on your PC.

Connections Path

In QC-PLC all the connections to the PLCs themselves are stored separately from the spec plans to allow you to re-use common connections across the spec plans. This path is where the list of connections is stored.

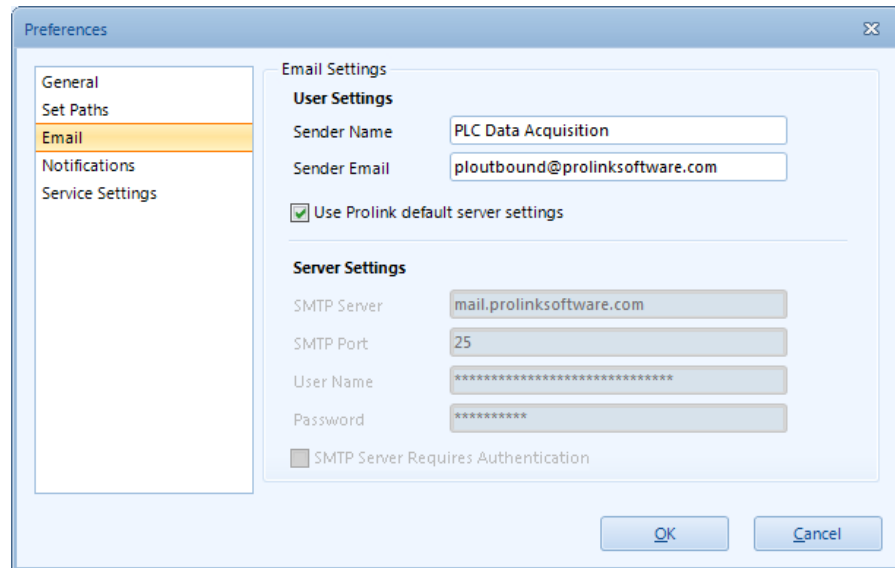
7.1.3 Email Settings

This screen is used to configure your outbound SMTP server for sending email. SMTP (or Simple Mail Transfer Protocol) is required in order for any application to send mail via the internet. The application (in this case QC-PLC) communicates with the SMTP server that resides on either your internal network or the internet and has the ability to route email. This is unrelated to and runs

Preferences

independent of any other email clients such as Lotus Notes or Microsoft Outlook. In fact, those email clients also must communicate with an SMTP server in order to send their mail.

By default, QC-PLC is set up to **Use Prolink default server settings** located on the Internet. This way, the email option works out of the box. However, it is recommended that you enter your company's actual SMTP server information as it will keep the traffic lower on Prolink's servers and increase performance (decrease the time it takes for you to receive an email from QC-PLC). In addition, you may not be able to use Prolink's servers if your IT department blocks SMTP transmissions to servers outside your network (firewall). If this is the case then your IT department should be able to help you set up this screen.



The screenshot shows a 'Preferences' dialog box with a sidebar on the left containing 'General', 'Set Paths', 'Email', 'Notifications', and 'Service Settings'. The 'Email' option is selected. The main area is titled 'Email Settings' and is divided into 'User Settings' and 'Server Settings'. Under 'User Settings', there are text boxes for 'Sender Name' (containing 'PLC Data Acquisition') and 'Sender Email' (containing 'ploutbound@prolinksoftware.com'). A checked checkbox labeled 'Use Prolink default server settings' is present. Under 'Server Settings', there are text boxes for 'SMTP Server' (containing 'mail.prolinksoftware.com'), 'SMTP Port' (containing '25'), 'User Name' (containing a series of asterisks), and 'Password' (containing a series of asterisks). A checkbox for 'SMTP Server Requires Authentication' is unchecked. 'OK' and 'Cancel' buttons are at the bottom right.

The fields are as follows:

Sender Name

The name that appears in the FROM box of emails you receive from QC-PLC. This can be anything you choose and should be something recognizable.

Sender Email

This is the email address that appears in the FROM box of emails you receive from QC-PLC. Due to security reasons, the domain portion of the email (everything after the @ symbol) should match the domain on your server. Otherwise, you will not be able to send emails. Notice how we are using the Prolink servers in the picture above and the sender email is from ploutbound@prolinksoftware.com.

SMTP Server

This is the server through which email will be sent. Your IT department can help you with this setting.

SMTP Port

This is almost always set to 25, but your IT department may have specific settings to use.

Preferences

User Name

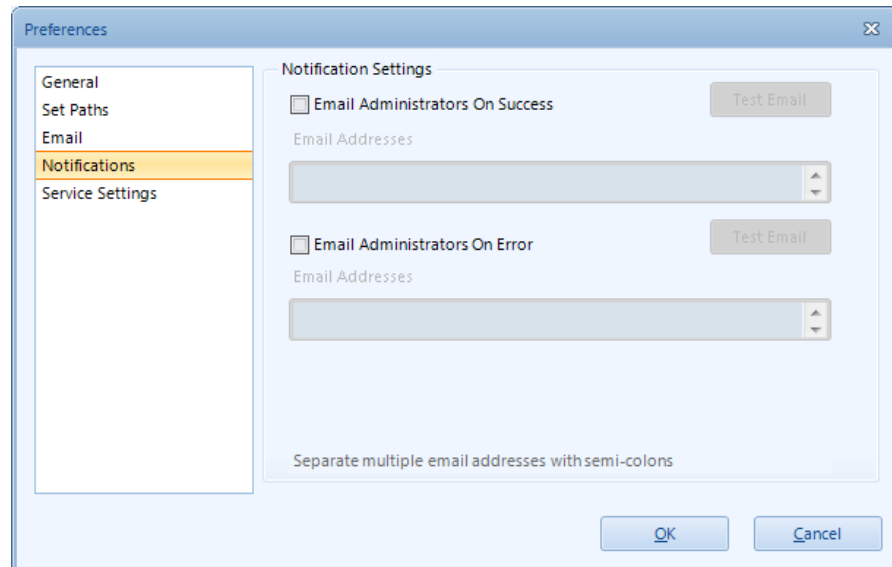
This is the account name that QC-PLC will use to send the email. If your SMTP server allows anonymous email sending, enter the word "test". Your User Name is displayed as zeros.

Password

This is the password for the account that QC-PLC will use to send the email. If your SMTP server allows anonymous email sending, enter the word "test". Your password is masked as asterisks.

7.1.4 Notifications

Since QC-PLC has been designed to run unattended, there are no error messages that pop up on the screen when it is running on the timer. Therefore, in order to know that an error has occurred, you may want to have QC-PLC email you the error so you can take appropriate action to fix it. This screen allows you to do just that. To enable the functionality simply check the **Email Administrators On Error** box and enter as many email addresses (or distribution lists) as desired separated by semi-colons (;). You can also choose to **Email Administrators on Success** if you would like to know when QC-PLC successfully collects data.



If you would like to generate a test email to make sure the email settings are correct, simply click the **Test Email** button. You should receive an email within a minute or two confirming the email settings are valid.

NOTE: If you have not set up the email settings (last section) you may not receive emails just yet. Make sure the SMTP settings are set and saved before testing the email. This means setting the SMTP settings, clicking OK to save the settings, and then going back into **Settings** to test the email.

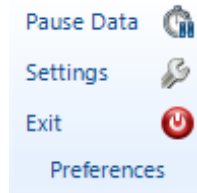
7.1.5 Service Settings

Please see [PLCDataService](#) on page [17](#) for details on setting up QC-PLC to run as a service.

8. File Tab

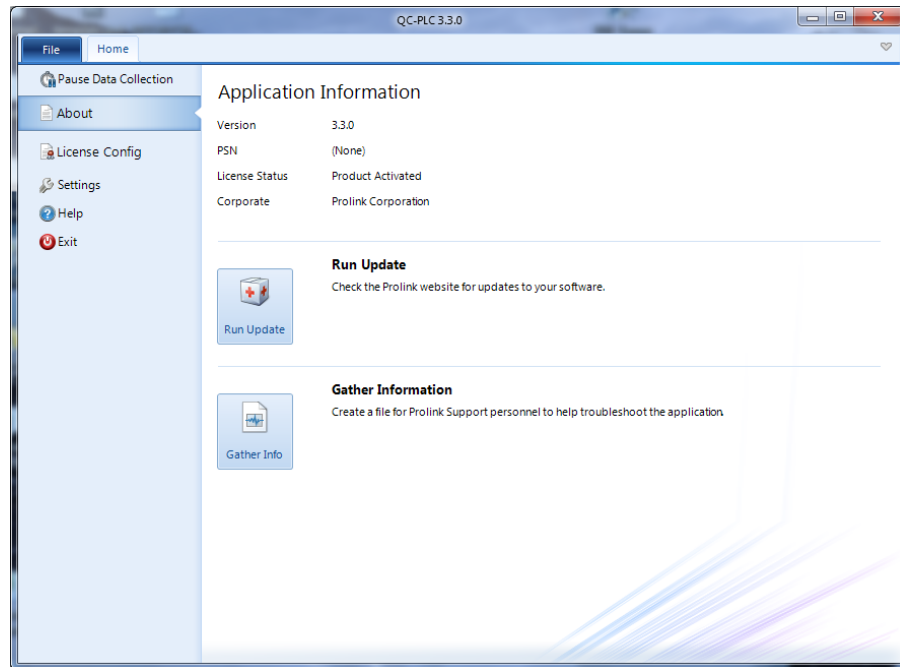
8.1 Pause Data Collection

This option pauses and restarts data collection. This is the same as the **Pause Data** button in the main ribbon bar.



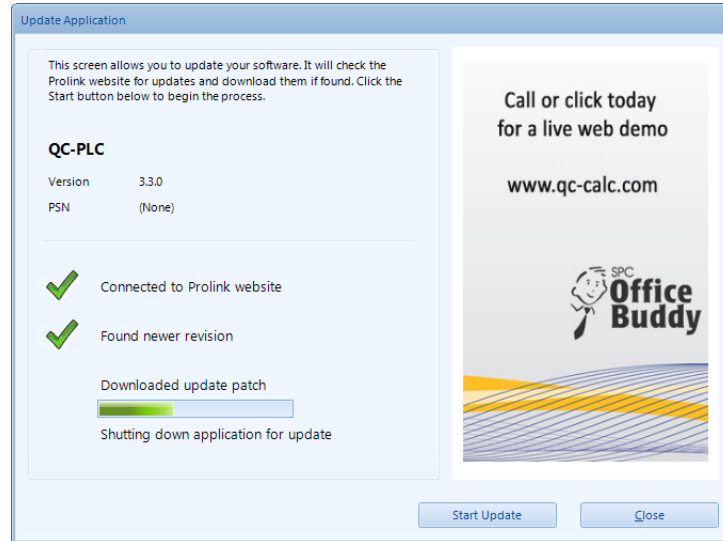
8.2 About

This screen gives you information about the version of QC-PLC. There are two main buttons on the screen; **Run Update** and **Gather Information**.



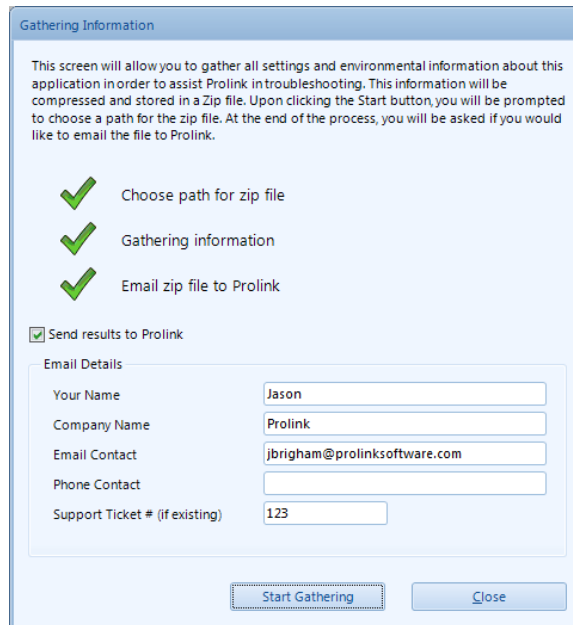
8.2.1 Run Update

This choice launches the update screen that will attempt to update your software to the latest version. To start the update, click the **Start Update** button. If a newer revision of the software is available, it will automatically download and install over your existing version. None of your settings are lost. Only the software itself will be replaced. You can cancel at any point during the download.



8.2.2 Gather Info

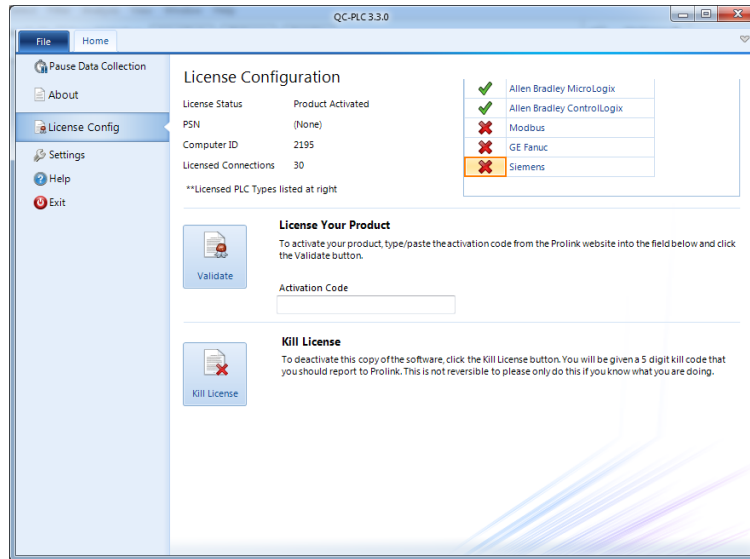
This button launches the form that you can use to gather information for Prolink. Under certain circumstances, Prolink personnel may ask you to run this command in order to troubleshoot your installation. The gather information file will gather all the local settings for QC-PLC, create a zip file, and email the file to Prolink for troubleshooting.



8.3 License Config

8.3.1 Description

This area of the application is used in conjunction with the Prolink website to activate QC-PLC. It shows your overall license status, Prolink Serial Number (PSN), Computer ID, number of licensed connections, and the PLC libraries that you have licensed. This screen is where you validate new licenses and kill existing licenses (for the purpose of transferring your license to a different PC).



8.3.2 Obtaining a License from Prolink

From the **My Account** area of the website, click the **Activate** link for the copy of QC-PLC you want to unlock and follow the directions for generating an activation code. You will need to enter the Computer ID shown in the License Configuration screen (pictured above). Clicking **Get Activation Code** will generate a 25 digit activation code that can be used to activate QC-PLC permanently.

8.3.3 Activating QC-PLC

Enter the activation code generated on the Prolink website in the **Activation Code** area of this screen and click the **Validate** button. If the code is valid, you will get a message stating that you have activated your software. The PLC libraries you have purchased will show green checkmarks beside them and the number of Licensed Connections will show in the box above.

Prolink licenses the number of available connections in groupings of 10. All copies of QC-PLC come with 10 simultaneous PLC connections by default. Please see your Prolink sales agent if you need more than the allotted amount.

8.3.4 Kill License

The **Kill License** button deletes the current license for QC-PLC. As mentioned above, this is typically used for transferring licenses between two computers. If this is done by mistake another Activation Code for the same computer can be generated by using the **Details** link listed for this copy of QC-PLC on the **My Account** page of the Prolink website.

If the **Computer ID** listed on the website does not match what is shown in the **Activate Software** screen you need to contact Prolink.

8.4 Settings

This area is used to control the settings of the QC-PLC tool. See [Preferences](#) on page [18](#) for more details.

9. Appendix A

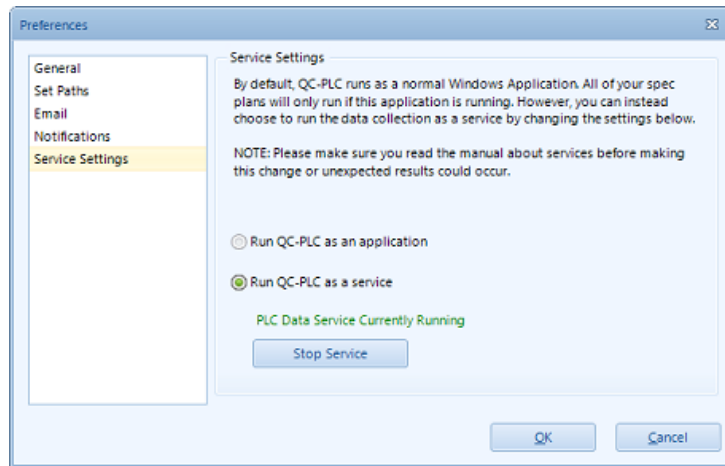
9.1 A Word about Windows Services

Windows services are a useful way to ensure your programs stay running even if the user doesn't stay logged into the workstation. Unlike normal Windows applications, services stay running on the computer even when the current user has logged off. This ensures that QC-PLC continues to load the data on schedule even if nobody is currently logged into the PC. However, with this benefit come a few considerations. Below is a list of items to consider when deploying QC-PLC.

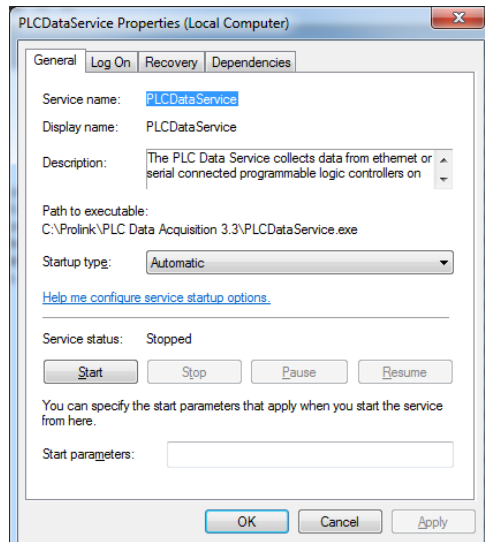
9.1.1 QC-PLC Client vs. PLCDataService

Since Windows services do not have screens, we split QC-PLC into separate pieces; the QC-PLC Client and the PLCDataService. The client is the application that appears when you run QC-PLC, change settings, create events, etc. The PLC Data Service is a silent application that runs in the background.

You can see the PLC Data Service running either by going to **Tools > Options > Service Settings** or by visiting the Services area in Windows. This is under **Start > Control Panel > Administrative Tools > Services**.

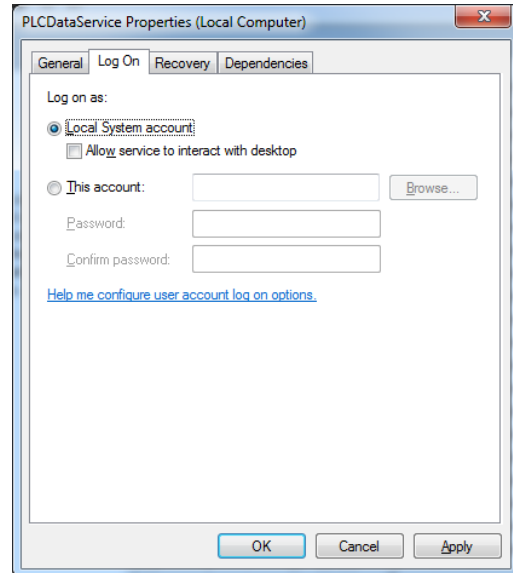


If you right click on the PLCDataService service, choose **Properties**, and the screen shown to the right appears. From this screen you can see the path where the executable actually exists and you can control the starting and stopping of the service.



9.1.1 Login Permissions

Remember that the service is running regardless of whether or not you are logged into the workstation. As such, it must have its own login settings in order to run and access files on the network. When you set up the security for the service, you're basically telling it to access the network as "xyz" user account. Whatever xyz has access to read, write, and delete, so does the service since it will log into the network as xyz. Typically you will want your IT department to create an "application" type user account on your domain. The difference between an application type account and a standard user account is that the application account doesn't usually follow all of the same rules.



For instance, it wouldn't make sense to have an expiring password since the service isn't going to be aware enough to change its password every 60 days.

Make sure the user account you have IT create has **read, write and delete** privileges to folders on the network where settings or other files exist. Once your IT department has given you a user id and password, switch to the **Log On** tab, choose **This account**, and enter the user id and password.

NOTE: You will need to stop and start the service after applying this in order for the changes to take effect.

NOTE: You can type your own login user account and password for testing purposes if necessary and it will work without problems. However, it is not recommended beyond testing because you will eventually change your password, forget to update it here, and the PLC Data Service will no longer have access to the network.

By default, you'll notice that the **Log On** is set to "Local System Account". This is a special user account in Windows that should work out of the box. However, in many cases it will not work because your IT department's security policy removes access. This is done for security reasons so viruses do not use your PC for unintended purposes.

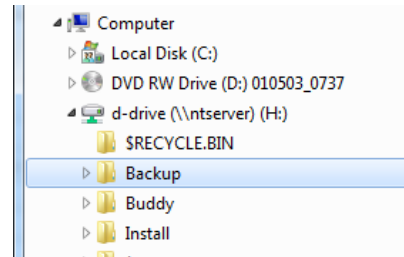
9.1.2 Mapped Paths/Drive Letters Illegal for Services

Unfortunately, using mapped paths does not work for services. This is because mapped drive letters (such as your "N" drive) are user specific. This means your N drive could be different from someone else's N drive. To simplify this, Microsoft has stated that services must use Unified Naming Convention (UNC) paths.

The UNC format will get you to the same place, but uses the server and shared directory directly rather than mapping it to a drive letter. The format is [\\servername\shared folder\folder\folder](#).

Appendix A

Using the example in the picture on the right, notice the H drive that is mapped in Windows Explorer. The actual path to which the H drive is mapped is [\\ntserver\d-drive](#). You can see this is defined just to the left of (H:). If you want to point to the Backup directory, then you would use [\\ntserver\d-drive\Backup](#). This is the equivalent of h:\Backup.



Anywhere you must specify paths when setting up QC-PLC (including the settings paths), make sure you use UNC style paths. Remember that the service will need to get to the path and it won't understand what your "M" drive is.

NOTE: You can use local drive letters such as C:\ or D:\ since they are local to the PC and will not change.

--- End of QC-PLC Manual ---