QualityWindow 6
The continuous improvement software

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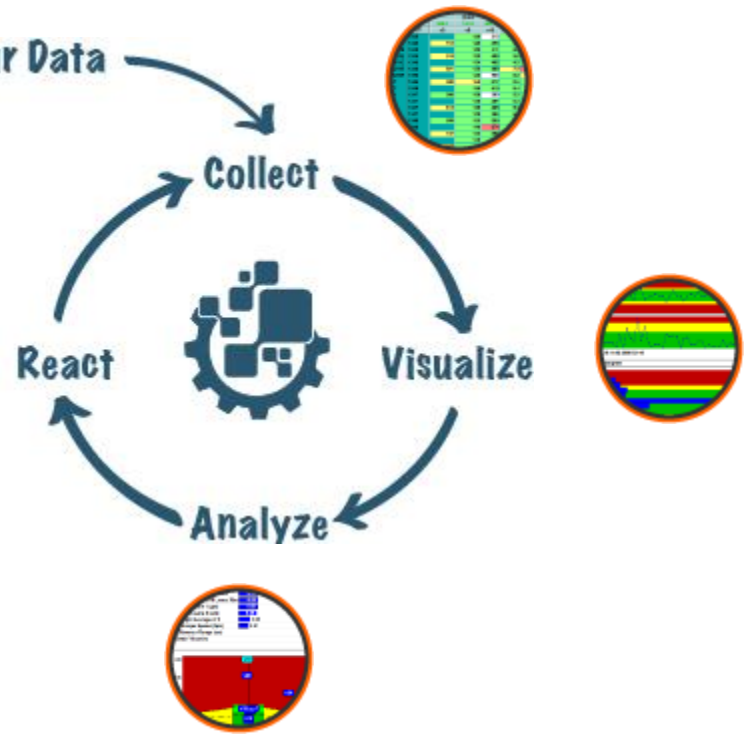

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Introduction

This document is intended to provide an overview of how to get started with the Quality Window 6 (QW6) product. It outlines how QW6 can be applied by providing examples of typical applications where QW6 can and is being used.

The flow of this document is designed to lead the reader through an overview of what a QW 6 application is and then the steps to follow in designing, developing and deploying QW 6 applications.

To get you going quickly with QW 6, I would suggest viewing some of the video presentations we have in our Video Tutorials section of the website. https://busitech.com/support/knowledge-base/

We suggest you begin with this presentation to assist you in better understanding what QW 6 is and how you can use it. https://busitech.com/tutorials/introducing-qw6/

Installing and Configuring QW6

Here are four important steps in getting started correctly with QW6…please read through all the steps before proceeding.

- Step 1. Install and configure QWLicense Server Software
- Step 2. Initial Install of QW6
- Step 3. Configuring/Organizing the Fileserver for QW
- Step 4. Configuring the Shared Resources Files.
- Step 5. Configure Security to limit access to QWAdmin and the Security database.

Step 1- Install and configure QW6 License Server Software

Note: There are two types of licensing available for QW6. One is dedicated standalone workstation licenses and the second, Concurrent User Licenses. Concurrent User Licensing is the recommended method of licensing for QW6 and the information below is based on Concurrent User Licensing.

The QW6 License Server software is a central piece of managing concurrent user licensing and making the Shared Resources files available to all users. The QW6 license Server software also ensures that all users are updated if changes are made to the Shared Resource files.

A third benefit is that the QW6 Administrator can view active users to see which QW6 Application are being access. This is important to know prior to making any revisions to active QW6 applications.

Contact Busitech who will provide a link to the QW6 License Server Installation package as well as a concurrent license key based on the number of concurrent users purchased.

Step 2- Initial Install of QW6

To begin the process the QW6 Administrator should install QW6 on s single workstation and from that workstation they will configure QW6. You can download the QW6 Installation package from the

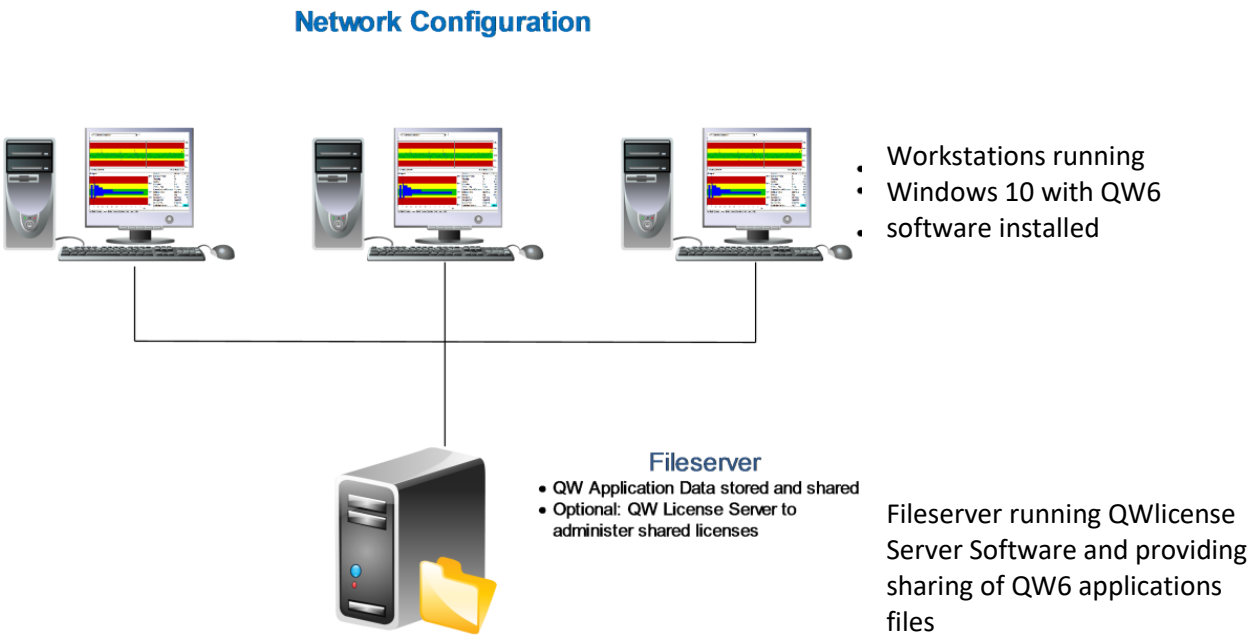
Busitech.com website. The installation process will provide you with a 30 day trial license you can use until you have the QW License Server Utility and concurrent licensing configured.

Step 3 – Configure/Organizing the File Server

The fileserver will be used for the following:

- Managing Concurrent licenses – QW6 License Server Utility
- Storing and providing access to the Shared Resource files
- Organizing and Storing QW6 Applications

The diagram below represents a typical installation configuration consisting of a fileserver and multiple workstations accessing QW6 Applications.



Typically, the location of the QW 6 Applications will be a Mapped Drive identifier for ease of access and the setting up of users for the applications. We will call it D:\QW6 for this discussion.

D:\QW6\QW6 Applications

D:\QW6\Shared Resources

- Units of Measure
- Default Statistics
- Default Control Rules

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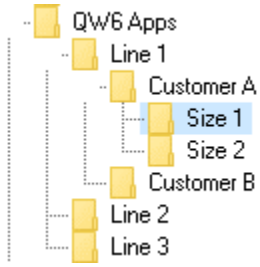
- Global Script file
- Security Database

Considerations for organizing your QW 6 Applications:

This is an important consideration. Your goal here is to help users select the right application to use each time.



The Begin screen in QW 6 is the first screen a user sees when they start up QW 6. It is important that the way you name your applications be consistent and clearly describe the application use. Make sure the names of your applications reflect the names operators will recognize them by. These would be the same names as on the Product labels or production schedule.

Example:
Line 6 Product A Size B Process Settings

- Product A would be the name of the product
- Size B is the further qualification of the product hat has a difference in specs and targets
- Process Settings helps people to understand the use of the application the word Settings is extra and could be eliminated

Line 6 Product A Size B Quality variables

- Quality Variables implies variables important to the customer that must be met.

Line 6 Downtime
Line 6 Quality Defects

If you group your applications by Line, then you may not need it in the name of the application, but you should have a variable in the application called Line with a constant value of “6” in this example. Doing this will allow you to combine application data later but still identify the Line it came from.

Structure of the Applications:

If you have 10-15 applications, then naming them consistently is important and having them appear on one Begin Screen would work for you.

If you have multiple production lines, multiple products and multiple sizes or customer specifications per product, then you need a good structure that will allow a user to easily navigate the applications in order to select the correct application to record and review data with.

Here are few ideas to consider that will help users pick the right applications.

You can organize your QW 6 applications into separate directories by Production line. You would have the Icon for QW 6 on the desktop of the Line workstation and the Home or default directory for that Icon would be the directory containing the applications for that specific line.

Within that directory, you can list all the products and sub-categories like size or unique customer. If the list of applications within one directory is too large, making selection of the correct application difficult, you can continue to create directories under the Production Line 1 to further breakdown the list.

An alternative to using the file system directories method is to employ a QW 6 feature called Directory Files Using this feature, you can place all your applications anywhere you like, and then use a QW 6 Directory Files to display the applications available to a user.

You can review the Directory Files Utility here:
https://busitech.com/tutorials/using-directory-files-in-qwadmin/

Storage Requirements:

The storage requirement for the QW 6 Applications should be determined to allow for proper allocation of disk space, as well as for backup requirements. Here are some of the factors that determine the space requirements for QW 6 Applications:

- Number of variables in an application
- Field length of those variables
- Number of records added based on how often data is recorded
    - Once an hour, shift or day
- Number of QW 6 applications you will have

Refer to this link in the Self Help Blog for a guide for determining QW 6 Applications space requirements.
http://www.busitech.com/Determining-Storage-Requirements-for-QW-Applications/

Step 4 – Configuring the Shared Resources Files.

The first step would be for the QW6 Administrator to use the QWAdmin module to review and configure the Shared Resource Files as necessary to meet the local requirements. These shared resource files are:

- Units of Measure https://busitech.com/tutorials/managing-units-of-measure-2/
- Default Statistics https://busitech.com/tutorials/setting-default-statistics/
- Default Control Rules https://busitech.com/tutorials/setting-default-control-rules/
- Global Script file https://busitech.com/tutorials/scripting-editor/
- Security Database https://busitech.com/tutorials/managing-security/

Based on the example File Server configuration mentioned above:

D:\QW6\QW6 Applications

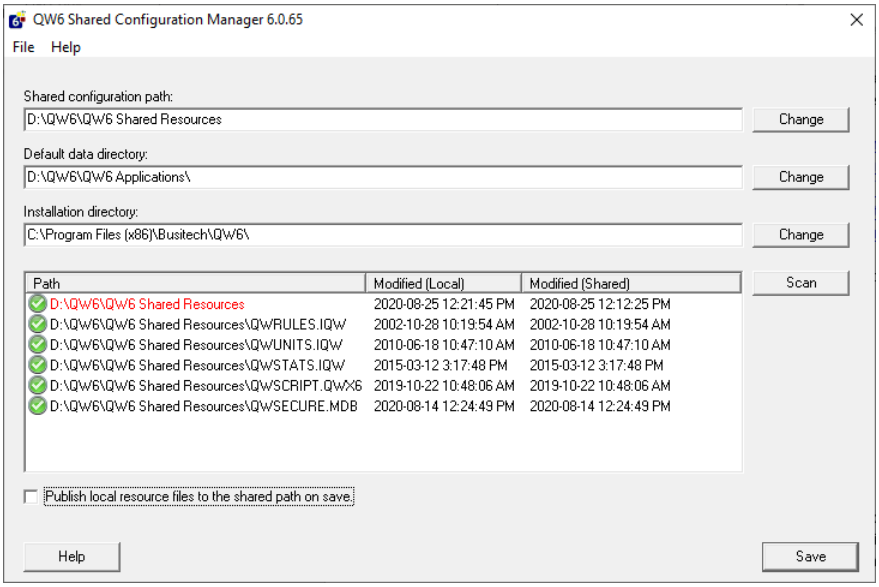
D:\QW6\Shared Resources

- Units of Measure
- Default Statistics
- Default Control Rules

- Global Script file
- Security Database

Once the Shared Resource files have been updated to meet local requirements the QW6 Administrator would then use the QWAdmin Shared Resource Manager to define the locations where the files will be located along with the default Home Directory location for the QW6 applications.

The QW6 Administrator would then Publish these changes to the Filer Server to share with all QW6 users.



The last step in configuring the resource files is to update the QW License Server Administration module on the QW6 Product page with the location of the QW6 Shared resource files. This will be used to point to the location when a user sign's on and update the local files if necessary.

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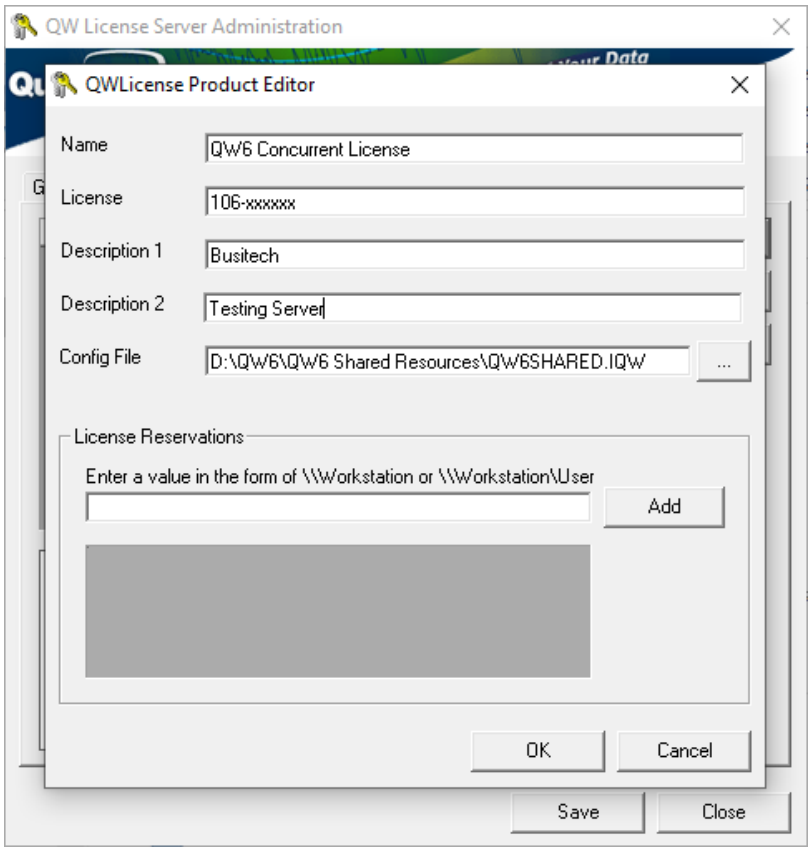

Video Tutorial: https://busitech.com/tutorials/shared-resource-manager/

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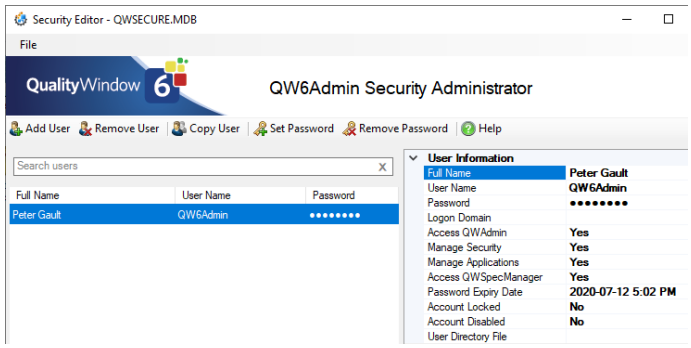
Step 5. Configure Security

Setting up your security database is an important initial step in configuring QW6. To start the process the QW6 Admin person should create Admin type users to provide secure access to:

- Admin users
- Security administrators
- Application Maintenance access
- Spec Management tool



This will protect against unauthorized access to the QWAdmin module and to its data maintenance tools.

Video Tutorial: https://busitech.com/tutorials/managing-security/

This completes the initial setup and configuration of QW6. You can now move on to creating your QW6 applications and saving them in the D:\QW6\App Data location on the file server.

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What is a QW 6 Application?

A QW 6 Application is a specific use of QW 6 to achieve an objective. Objectives like conducting a Process Audits or to track Downtime. More specifically, you would create a QW 6 Application that would collect and monitor the process settings on Line 15 while making Product X size 3. The QW 6 application would contain all the settings, variables, specifications, and targets to accomplish this specific task. You can create additional applications almost identical to this one but for different products, sizes and production lines.

Once you decide on the type of application you would like to create with QW6, then it is just a matter of assembling the information and getting to it. The QW6 product is designed to help you build these applications quickly and change them just as quickly…the rapid change capability of QW6 is a key feature of the product and is why QW6 applications are typically supported at the department level by key individuals or champions – Quality Lab or Production lines, for example.

So, let's get started and here is an outline of the key items:

- Application possibilities
- Planning a QW 6 Application
- Building a QW 6 Application

Application possibilities – two main types of Applications

1. A monitoring application – regular timed interval for sampling data – minimize variation and run to target – Uses Specification, Control and Target Limits as well as Control rules (Alarms)
    - Process settings
    - Quality variables
    - Product variables
    - Raw material verification
    - Fill weights
    - Equipment validation

2. An event application – capture details of events - find and fix causes of failures
    - Downtime
    - Quality Defects
    - Loss/waste
    - Customer complaints

While there may me two main types of applications (Interval and Event), there are many options for collecting the data.

1. Manual data entry - record data using the keyboard on a Workstation
2. Manual but supplemented – add devices like weigh scales to capture data at its source
3. You have data in another format and want to view it in a Quality Window – got data and want to see it
    - Excel data organized in rows and columns – **QW6XltoQW utility**
        - https://busitech.com/tutorials/xl-to-qw-importer/

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- Data is in an SQL data base and you want to view it – **QW6SQLWizard utility**
  - https://busitech.com/tutorials/sql-wizard/

4. I want to capture and view data from Automation Systems – automating data collection
   - Data in PLC based automation and control system – **QW6DataHub – bridge to automation data** https://busitech.com/products/qwdatahub/
   - I want to capture it on a scheduled or Event basis – **QW6Scheduler Utility**
     - **https://assets.busitech.com/pdf/qw6/AutomatingDataCollection-QW6.pdf**

If you don't see what you are looking for, send us an e-mail…we are pretty creative and enjoy a challenge!

Building a QW 6 Application

We will use a Process Monitoring example in the discussion of building an application. The key steps are:

- **Design it** – plan out your application
- **Develop it** – Use QWAdmin to create and change QW 6 Applications
- **Deploy it** – put the infrastructure in place and roll it out

Design it:

This type of application is designed to keep you on a fixed path – minimize variation and run to optimum target. You want to make a product the same every time so a customer or downstream process, sees or detects little or no variation in the product or service provided.

To accomplish this, you need to employ tools such as limits –Specs and targets, Rules and, as usual, timing is everything.

Planning the application is important as it will help organize your thoughts and provide structure to what you are trying to accomplish. Putting a little planning effort in first will help you avoid re-work in the future - typically you would be part way through the development and realize you forgot something important and must start over.

Here are a few guidelines to help you in your planning:

What is the purpose of the Application?

- Verify process settings on start up
- Ensure product requirements are met

These two statements tell you a lot on how to proceed.

How will you group the variables you collect?

- By Line
- By Customer

- By product
- By size
- By colour

Now you are getting the picture…how you answer these questions can dramatically affect what you end up with. For instance, if you build applications by product, do you include sizes in one application or separate sizes into different applications?

Remember, each of the groupings above probably results in a difference in the targets and specifications to be applied. This is a clear indicator for grouping of parameters you are monitoring into individual applications.

What variables are you going to collect?

This is a very important decision. What do you have to keep an eye on to avoid issues like defects, waste or downtime events? I can tell you with great confidence, you will not think of them all and as you learn from your process, you will update this list.

Note: One of the most powerful investigative tools available in QW6 is the ability to statistically test the relationship between variables in your application. Consider this in deciding what variables you want to include in your application. Investigate the use of automation interfaces to supplement the data collected.
See: Can calculated variables add value to your application? Below

The simplest items are always the mission critical ones that affect product performance, customer satisfaction. If your customer specifies it in their requirements you should be checking it and the items that may affect or influence those items. If you need it for a Certificate of Analysis, you need to be checking it. All regulatory requirements should be checked as well.

What order do you put the variables in an Application?

There are several options on the order of the variables in a QW 6 Application.

- If you are converting to QW 6 from a paper log sheet, use the order of the variables from the existing document. This has the advantage of being more familiar to the people using the application. Remember to eliminate variables no longer used from the old sheet.
- Order the items in the same sequence they will be collected during the walk around.
- Place the most critical variables first in the collection process to highlight these issues quickly.
- Views in QW 6 can also be used to revise the order of the variables for the analysis of the data.

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Where are you going to get the limits for each variable?

Maximum Value	99.9
Upper Specification Limit	Calc
Upper Control Limit	Fixed 7.7
Upper Warning Limit	Calc
Target	Fixed 6
Lower Warning Limit	Calc
Lower Control Limit	Fixed 4
Lower Specification Limit	Fixed 2.05
Minimum Value	-9.9

Note: Limits are Specification, Control Warning and Target values

These limits can come from customer requirements, product specification, and regulatory requirements but you do need to get them from somewhere.

A quick overview on the different limits available for a numeric or calculated variable in a QW 6 Application:

- Specification Limits, both upper and lower – data will appear in white – think white hot!
  - Typically, these are your reject limits, if a result is outside of these it's a serious problem
  - These could be based on customer, performance or regulatory requirements
- Control Limits, both upper and lower – data will appear in red – think trouble brewing!
  - These limits are usually based on the capability or performance of a variable
    - For this variable for this product on this line, it should stay within these limits
  - Setting good realistic control limits are important to avoid hitting the Specification limits. Control limits are your early warning of problems allowing for you to look into an issue before it results in a reject or shut down.
- Warning Limits, both upper and lower – data will appear in yellow – a variable is wandering away from target.
  - Used to indicate that the variable is now closer to a control limit than it is to target
  - Why is this important? – A target is set for a reason – performance and cost are two key items – why are you wandering away from it?
- Target – the green area, the place that you want every variable to ideally be.
- Maximum and Minimum values can also be set to assist in data validation on entry

So, your job is to determine and set all these limits –if you can! Quality Window 6 can help here. There are three settings available for each limit (Specification, Control, Warning or Target) that you can assign to a variable.

- Fixed – this means you set a specific value
- Calculated – QW 6 will set the value based on the data currently in memory and is usually based on the value of Standard Deviation (there are modifiers for calculating limits (see http://www.busitech.com/Getting-the-most-out-of-your-Control-Limits/)
  - Specification limits +/- 4 SD
  - Control limits +/- 3 SD
  - Warning Limits +/- 1.5 SD
  - Target - Average
- Blank – Limit and corresponding colour is disabled

You can use any combination of the above settings to best meet your goals. For instance:

- Fixed Spec limits with calculated Control limits
- One sided limits – fixed upper spec limit and a blank lower spec limit
- For a number, like Batch or Run number, that you want to be numeric, set all limits to Blank.

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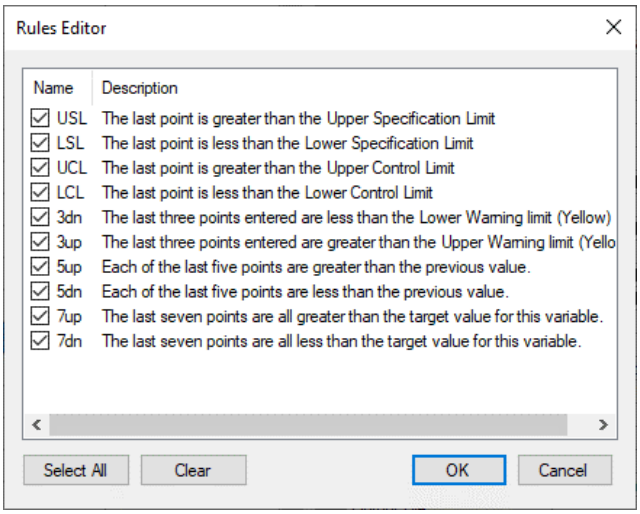
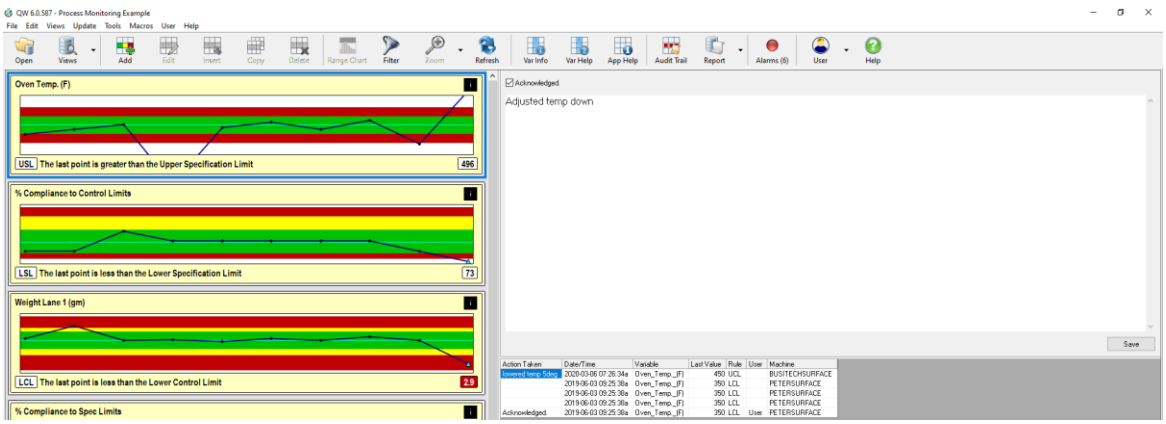
Using Control Rules – Alarms to help monitor the data



For each numeric or calculated variable that you have limits defined for, you can also turn on Control Rules. These rules or alarms work with the Summary screen in QW 6 to display alerts based on the most recent data entered through the Add data screen. QW 6 comes with a set of pre-defined rules to use or you can create your own.

For each variable, you can turn rules on and off to best meet your needs for an application. For instance, if a high value is a concern then the Rules for Upper Specification and Control can be turned on while a low value is not a concern then turn off the rules for the Lower Specification and Control limits. By only displaying Rule violations where they are important will help people focus on the important issues.



Using the Alarm screen in conjunction with the Rules and Limits supports the methodology “if it is not broke don’t fix it!” So, when the data is entered, only problems that should be reacted to will be displayed.

How often should these variables be checked

This is another decision that can affect how QW Applications are organized. If all variables have the same sampling frequency, example 1 hour, then it makes sense to place them all in one QW 6 application. QW 6 does allow variables with varying sample rates to be in one application. (see http://www.busitech.com/Using-the-Sampling-Plan-feature-in-QW-5/)

This makes sense when there may only be a few of them that are different, and you still want them included for analysis purposes. But when there is many these, it may make sense to separate them into individual QW Applications like an hourly audit and a once a shift audit.

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Sampling frequency is important and getting it right can make all the difference. If you don't sample often enough you could be making rejects. Sample too often and you are wasting valuable resources.

Effects on sampling:

- Regulatory requirements
- Variation in a process/product
- Product/Customer requirements
- Raw materials – lot changes

Having data is the best measure of your process and reviewing it will go a long way to helping you establish the correct sampling plan for your Applications.

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Are any Variables required entries?

The data you collect may have items that are “Mission Critical” to the product or process you are tracking. In this case you may wish to set those variables to “Required” during the definition process. This will ensure that the user cannot exit the Add screen process without recording a value for variables designated as “Required”

Variable Details	
Variable Number	8
Variable Name	**Batch_Viscosity**
Field Type	Numeric
Length	**4**
Decimals	0
Maximum Value	**9999**
Upper Specification Limit	**Calc**
Upper Control Limit	**Calc**
Upper Warning Limit	**Fixed 910**
Target	**Fixed 900**
Lower Warning Limit	**Fixed 890**
Lower Control Limit	**Calc**
Lower Specification Limit	**Calc**
Minimum Value	**0**
Calculate Limits Based On	Population
Limits Centered On	FixedTarget
Active Rules	**USL,LSL,UCL,LCL,3dn,3up,5up,5dn,7up,7dn**
Required	Yes
Protected	No

Ideally this feature would be used for Customer requirements, quality checks or product performance measurements.

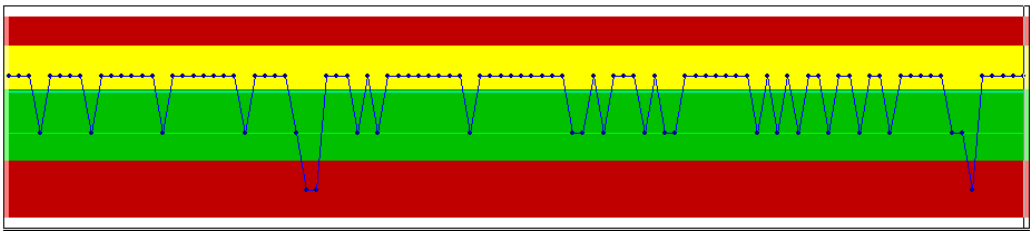
Can calculated variables add value to your application?

Think of a calculated variable in a QW 6 application as “free” data because you get the results without any effort. A calculated variable can be used to produce averages or ranges of other data that has been entered like Fill Weights. @AVG[V9..V12]

This one will calculate what the current shift is based on the current time.
@CASE[@HOUR[V2]+(@MINUTE[V2]/60),7.50,15.49,10,15.50,23.49,20,23.50,24.00,30,00.00,7.49,30]

You can also use them to produce summary statistics like the % of variables entered that meet Specification Limits for individual records entered. @COMPLYSL%[V7..V11,V13..V21,V25]

The other advantage to calculated variables is that you can apply limits to them like a numeric variable and display results in colour and chart the data for a very visual presentation.



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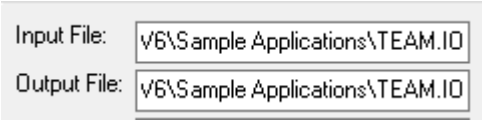
Can default values improve the data capture process?

To assist the people collecting data you may want to consider offering default values – especially for reoccurring data like Shift, Team or Product. For instance, if you are performing hourly checks and the values for some variables repeats from the last entry you can provide a default value of the last value entered.

This is done using the Input/Output field definitions available for each variable in a QW 6 application.



	Variable	Value
1	Date YYYY-MM-DD	2020-04-20
2	Time HH:MM:SS	12:00:35
3	Team	20-B Team
6	Product Description	10-Chocolate chip
9	Downtime Type	10-Unplanned

The Add screen will display the value from a file that is defined as an Input file for the variable. The Output file will have the value from the Add screen written to it when the data is saved. Using the same file name for both the Input and Output file enables the default value feature. Here is a link for more information on this feature.
http://www.busitech.com/Using-Input-and-Output-Files/
Video Tutorial: https://busitech.com/tutorials/interfacing-in-qw6-input-output-files/

Can interfaces to other systems or devices be used?

The collection of data can be a time-consuming process. Interfaces can help to decrease the time to collect the data as well as improve accuracy. In QW 6, there are a variety of interface opportunities to assist in the data collection process.

- Measuring devices like weight scales. These RS232 devices can be integrated into the Add data process and greatly decrease the time to do product checks and Fill Weight applications
- Individual data values for variables can be acquired from Automation Systems (Programmable Logic Controllers PLC's) using IO Servers and a connection to those systems. These would be values like pressures, temperatures and speeds that are monitored by the Automation System. Defining an Input file for a variable with the DDE or OPC address in the PLC can obtain that data when the Add key is pressed in a QW 6 application.
- QW 6 supports VB Scripting modules that can be developed (by you or us) to link to existing data sources like an SQL database to obtain data via the Add Screen processing interface and provide it as a default value when the Add screen is presented.

Video Tutorial: https://busitech.com/tutorials/interfacing-in-qw6-collecting-data-using-an-rs232-interface/

Are there any security or regulatory requirements for capturing and editing of data?

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QW 6 has security options that can be enabled to assist in the restricting of access to some functions for example:

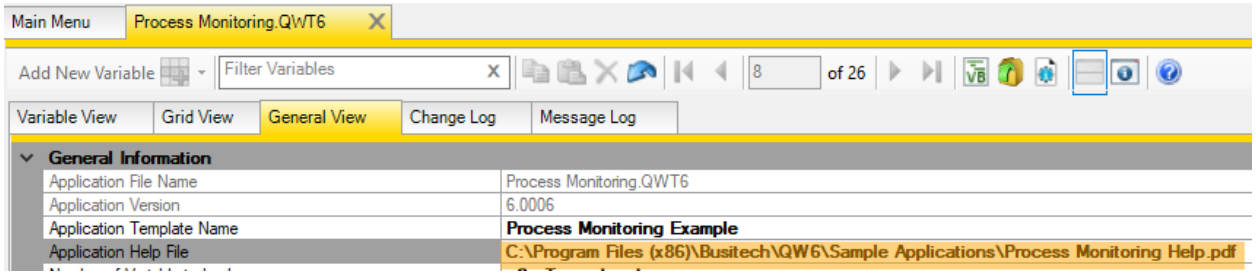
- anybody can add data, but only certain individuals can edit or delete the data
  Video Tutorial: https://busitech.com/tutorials/managing-security/
-
- Traceability of the data for meeting requirements like FDA 21 CFR part 11 though the use of transaction logging for every add, edit or delete of data in an application.
- http://www.busitech.com/meeting-the-21-cfr-part-11-requirements-with-quality-window-5/

Will a Help System improve the application? – YES!

Consider this - *It is 3am in the morning and a critical variable has gone outside specification limits. What do you want the operator to do? Phone you or follow a documented Current Best Approach (CBA) for investigating and solving the problem?*

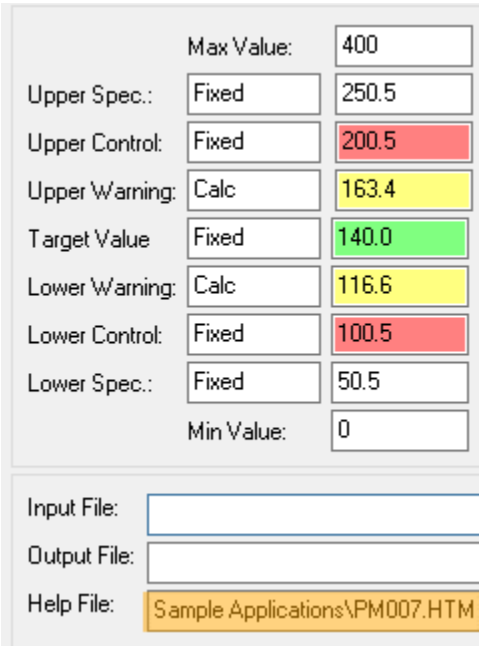
I know which one I would want the operator to choose!

There is an Application Help file that can be used to provide an overview of the application and key variables essential to the product or process being monitored. The file can be created in MS Word and saved as a PDF to be included in the Application Template.



Also available for each variable defined in a QW 6 application, you can define a help file to point to that contains the CBA for that variable. From the Alarm Screen, which displayed the Rule violations, the operator can select User Help and the best approach for overcoming the issue is displayed for them. The key points are for providing this help are:

- It is available when it is needed at the click of a mouse – no need to search for it
- It can provide a structured method to resolve the problem. Everybody using the same playbook – that's team work!



You can define these Help files in any format (Word, Excel, PDF, HTML or a Video) and QW 6 will present the data using the default Windows viewer for this file. This is the last step in creating a QW 6 application, but it is important to consider it in the planning cycle.

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Develop It – Building the Application

After reviewing these items and considering the points presented, it is time to start building your application. The QWAdmin tool is what you will use to create and change your QW 6 Application. I mention change because that is what you will do most with your QW 6 Application, and the QWAdmin tool is designed to give you a "rapid change" capability to do that.

So don't worry that you may have forgotten something like a variable or the order of the variables in the application you can easily revise the application later.

QWAdmin - Let's get started!

There are four tabs to select from when changing a QW 6 Application under the QWAdmin – Application selection:

- **Application Settings** – define General setting for an application
- **Variable View** – Add, change and order the variables in a QW 6 Application
- **Grid View** – make limited changes to a QW 6 Application in a grid format
- **Script** – Define Application specific VB Script routines

Variable View – adding, editing and arranging Variables

A QW 6 Application can have the following field types:

- T – Text – used for non-numeric uses like a comment field
- N – Numeric – a measurement field that will want to assign limits to and chart the data
- C – Calculated – a value that is determined by a formula – average of three variables
- P – Popup – a selection table of values to pick from – Shift, Team or Product
- L – Lookup a calculated test field associated with a P-Popup file
- A – Average – like a calculator window input 5 values and it returns the average
- R – Range – works with the A-average field to provide the range of the values entered

Note: The A-average and R-range variables are special use variables where retaining the original data is not required. It is recommended that you use the C-calculated variables for generating average and range values.

Suggestion: Draw out your application on paper. List all the variables down a page like this:

Date
Time
Shift
Team
Team_Leader
Line_Speed_(fpm)
Run_Number
Bottle_Weight_1 (oz)
Bottle_Weight_2 (oz)
Bottle_ Weight_3 (oz)

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Average_Bottle_Weight (oz)
…
Comments

Do not worry about forgetting anything as you can always insert them later.

Note: When I define a variable name, I like to capitalize the first letter of each word and include the unit of measure as the last item. This makes the names easy to read and having the unit of measure. There is also an option to include a Unit of Measure in the variable definition as well.

Note: Did you notice the underscore character (_) between the names of the variables above? This is a method of telling QW 6 to split the name of the variable on multiple lines on the Log Sheet screen. This can make columns much narrower like the example on the right.

Conveyor Speed (fpm)	Conveyor Speed (fpm)1
140.0	140.0
v7	v8
148	
159	

Variables Types and definitions

Next, think of the type of data you want to collect in each field. We will explore the different field types and their options in this overview.

Date and Time Fields: these two are by default the first two fields in a QW 6 application and are defined as T-text type variables. You do not need to make any changes to these fields. If you wish, you can change the name of the variables to say Production Date and Production Time to add clarity to the information captured

T-Text – example Comments variable:

This is the simplest variable definition in a QW6 application, but a very useful field for collecting important data. It is typically text type data that you do not want to chart so it shows up always in black on the screen. You would use this type of field for things like Comments that provide a way of entering information that is relevant to current operating conditions, or actions taken as a result of an issue.

Suggested setting for a Text Variable:

Variable Details	
Variable Number	7
Variable Name	**Batch_Number**
Field Type	**Text**
Length	8
Required	No
Protected	No
Sampling Plan	0
Convert to Capital Letters	**Yes**
Input File	**C:\Program Files (x86)\Busitech\QW6\Sample Applications\BATCHNO.IO**
Output File	
Units of Measure	
Reference Fields	**(Collection)**
Help File	**C:\Program Files (x86)\Busitech\QW6\Sample Applications\PM005.htm**

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- **Variable Name:** Comments – don't forget to use the underscore character between words if needed
- **Variable Type: T-Text**
- **Length:** 40 – your choice you can set it to 100 or more if there is a need for allowing for verbose comments
- **Required:** If you want this field to be entered every time set to Y, typically No.
- **Protected:** Set to Yes if the value is collected externally and you don't want to allow changes.
- **Sampling Plan:** Unless you require a comment each time, not recommended, set to zero (0) meaning optional. **See:** Sampling Plan Explanation for Numeric variable below
- **Convert to capital letters:** Recommend you set to No if this is a comment field, no one likes to see all capital letter in a message. Set to Yes if this is a field like Team that is being manually entered where it can be A,B,C or D then I would check this option. This will take a lower case "a" and convert it to a capital "A" making filtering data later easier.
- **Input and Output files:** Typically, not required for Comments. (See Line Speed (Input/Output Files) for more information on this option.
- **Unit of measure** – leave blank
- **Reference Fields:** Blank (see Line Speed - Reference Fields for more information on this option.)
- **Help File:** Leave Blank if there is no need for help on this variable.

N-Numeric - Line Speed Field

Conveyor Speed is a variable that you would want to monitor as it can greatly affect a process. It will be a numeric value and you will want to apply limits to it.

Variable Details	
Variable Number	9
Variable Name	**Conveyor_Speed_(fpm)**
Field Type	Numeric
Length	**3**
Decimals	0
Maximum Value	**400**
Upper Specification Limit	**Fixed 250.5**
Upper Control Limit	**Fixed 200.5**
Upper Warning Limit	**Calc**
Target	**Fixed 140**
Lower Warning Limit	**Calc**
Lower Control Limit	**Fixed 100.5**
Lower Specification Limit	**Fixed 50.5**
Minimum Value	**0**
Calculate Limits Based On	Population
Limits Centered On	FixedTarget
Active Rules	**USL,LSL,UCL,LCL,3dn,3up,5up,5dn,7up,7dn**
Required	No
Protected	No
Sampling Plan	**1**
Input File	
Output File	
Units of Measure	**ftm**
Report Type	Variable
Reference Fields	**(Collection)**
Help File	**C:\Program Files (x86)\Busitech\QW6\Sample Applications\PM007.HTM**

Variable Length:

Part of deciding on the length of a variable is to understand the number of decimal positions required.

Variable Name	Roll_Width_inches
Field Type	Numeric
Length	5
Decimals	2
Maximum Value	12.00
Upper Specification Limit	Fixed 6.5
Upper Control Limit	Blank
Upper Warning Limit	Blank
Target	Fixed 6.43
Lower Warning Limit	Blank
Lower Control Limit	Blank
Lower Specification Limit	Fixed 6.37
Minimum Value	5.00

In this Roll Width Inches variable example if two decimal places are required (10.43) then the field length would be 5

- 2 for the integer (10)
- 1 for the decimal point
- 2 for the decimal positions

If the value can be a negative value? -10.56 then the field length would be 6 to allow for the sign (-).

Maximum and Minimum Limits.

Setting a Maximum and Minimum limit for a numeric variable is important to act as a test on the Add and Edit screens to avoid the entry of unreasonable values. Verify that when setting the Max and Min values that they are outside the allowable values to be entered. By default the value is set to the maximum and minimum values based on the Variable Length and Decimals defined for the variable.

Setting Limits

Note: Limits are Specification, Control, Warning and Target values

These limits can come from customer requirements, product specification, and regulatory requirements but you do need to get them from somewhere.

An overview on the different limits available for a numeric or calculated variable in a QW6

Maximum Value	400
Upper Specification Limit	Fixed 250.5
Upper Control Limit	Fixed 200.5
Upper Warning Limit	Calc
Target	Fixed 140
Lower Warning Limit	Calc
Lower Control Limit	Fixed 100.5
Lower Specification Limit	Fixed 50.5
Minimum Value	0

Specification Limits - both upper and lower – data will appear in white – think white hot!

- Typically, these are your reject limits, if a result is outside of these it's a serious problem
- These could be based on customer, performance, or regulatory requirements

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Control Limits - both upper and lower – data will appear in red – think about trouble brewing!

- These limits are usually based on the capability or performance of a variable
- For this variable for this product on this line, it should stay within these limits
- Setting good realistic control limits are important to avoid hitting the Specification limits. Control limits are your early warning of problems allowing for you to investigate an issue before it results in a reject or shut down.

Warning Limits - both upper and lower – data will appear in yellow

- Used to indicate that the variable is now closer to a control limit than it is to target
    - Why is this important? – A target is set for a reason – Minimize variation and run to target – these are both key items in terms of performance and cost.

Target Limit – the green area, the place that you want every variable to ideally be centered.

Types of Limits

There are three settings available for each limit (Specification, Control, Warning or Target) that you can assign to a variable.

- **Fixed** – this means you set a specific value
- **Calculated** – QW 6 will calculate the value based on the data currently in memory and is usually based on the value of Standard Deviation (there are modifiers for calculating limits (see http://www.busitech.com/Getting-the-most-out-of-your-Control-Limits/)
    - Specification limits +/- 4 SD
    - Control limits +/- 3 SD
    - Warning Limits +/- 1.5 SD
    - Target - Average
- **Blank** – Limit and corresponding colour zone is disabled

You can use any combination of the above settings to best meet your goals. For instance:

- Fixed Spec limits with calculated Control limits
- One sided limits – fixed upper spec limit and a blank lower spec limit

Note: If you are defining a numeric value to record a Run or Order number you do not require limits so you can Blank all the limits and the data will be displayed in black.

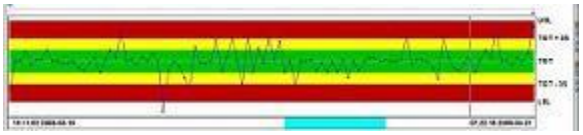
Calc. Limits Based on gives you the additional capability to calculate limits that are set to C- calculated more accurately. The options here are:

- Population
- MR Estimate
- Low Variation
- High Variation
- Low Average
- High Average

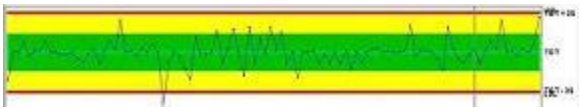
We suggest selecting Low Variation. What this will do is scan the data for the variable and select 20 consecutive points that have the lowest Standard Deviation and then use that value to calculate the control limits. (+- 3 times Lowest SD)

This means your control limits always reflect the best recent performance you were able to achieve which in turn means that you don't have to keep manually adjusting your Control Limits every month or so.

The following charts demonstrate Control Limits set with Low Variation and the second with using the Standard Deviation of the Population.



Low Variation



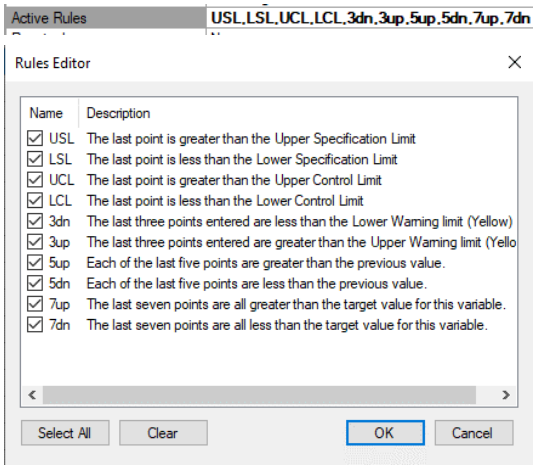
SD of Population

The Low Variation option provides you with Control limits away from the Specification limits thus giving you ample warning of process upsets as an Out of Control situation rather than Out of Specification or reject level.

Limits Centered on: This is used to determine if Calculated limits should be centered around a fixed target value of the calculated average for the data. If your average is positioned away from a fixed target, then by setting this value to Calculated will mean you do not have symmetrical limits around the target value. In some cases, the target value could appear in a red zone. It is recommended you set this to Fixed Target if you are using calculated limits.

Using Control Rules – Alarms to help monitor the data

For each numeric or calculated variable that you have limits defined for, you can also turn on Control Rules. These rules or alarms work with the Alarm screen in QW 6 to display alerts based on the most recent data entered through the Add data screen. QW 6 comes with a set of pre-defined rules to use or you can create your own.



For each variable, you can turn rules on and off to best meet your needs for an application. For instance, if a high value is a concern then the Rules for Upper Specification and Control can be turned on while a low value is not a concern then turn off the rules for the Lower Specification and Control limits. By only displaying Rule violations where they are important will help people focus on the important issues.

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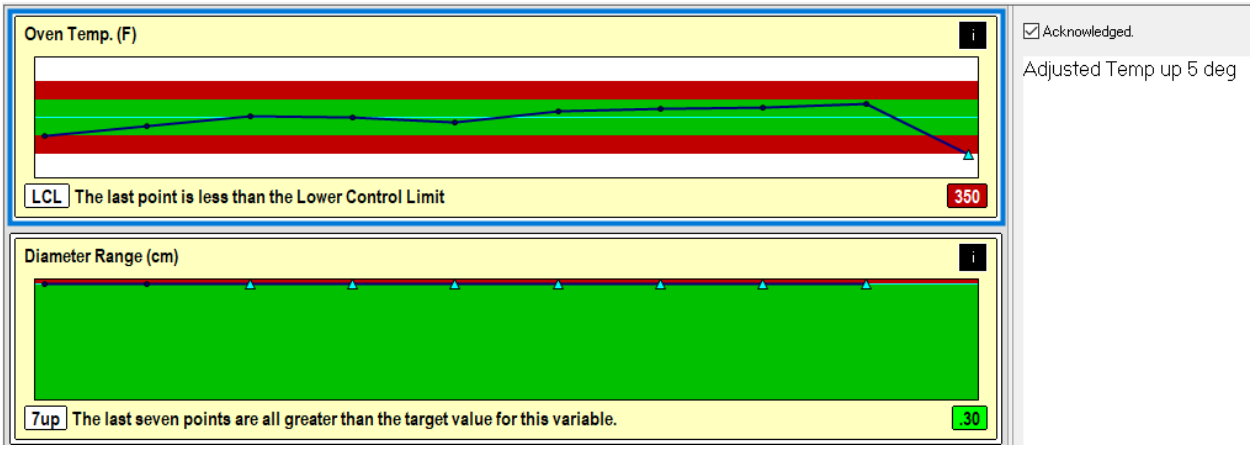
Need a little help getting started



See Video Using the Alarm screen

Using the Alarm screen in conjunction with the Rules and Limits supports the methodology "if it is not broke don't fix it!" So, when the data is entered, only problems that should be reacted to will be displayed.

Required: If you want this field to be entered every time set to Y, typically No.

Protected: Set to Yes if the value is collected externally and you don't want to allow changes. Data from weigh scale or Automation system (PLC)

Sampling Plan - How often should these variables be checked

This is another decision that can affect how QW Applications are organized. If all variables have the same sampling frequency, example 1 hour, then it makes sense to place them all in one QW 6 application. QW 6 does allow variables with varying sample rates to be in one application. (see http://www.busitech.com/Using-the-Sampling-Plan-feature-in-QW-5/)

This makes sense when there may only be a few of them that are different and you still want them included for analysis purposes. But when there is a large number of these, it may make sense to separate them into individual QW Applications like an hourly audit and a once a shift audit.

Sampling frequency is important and getting it right can make all the difference. If you don't sample often enough you could be making rejects. Sample too often and you are wasting valuable resources.

Effects on sampling:

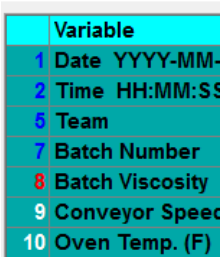
- Regulatory requirements
- Variation in a process/product
- Product/Customer requirements
- Raw materials – lot changes

Having data is the best measure of your process and reviewing it will go a long way to helping you establish the correct sampling plan for your Applications.

Need a little help getting started

Sampling Plan Explained:

Used to indicate on the Add screen, when a variable is to be entered. It can be used with the Required – Yes option to force entry of value on the Add Screen. Sampling plan is a numeric entry that sets the Variable Reference Number (numbers to the left of the variable name) on the Add screen to difference colours to help indicate when data show be entered.



Set to zero - displayed in **blue** means the entry for this variable is **optional**
Set to 1 - displayed in white means please enter a value for this variable each time a record is added but not required
Set to 2-99 displayed in white means please enter a value for this variable every second time (in the case of a 2) a record is added to this application.
A Variable Reference Number displayed in Red indicates a **Required** entry field.

Please refer to this Self Help entry for more information on Sampling Plan
http://www.busitech.com/Using-the-Sampling-Plan-feature-in-QW-5/

Input/Output files:

These two fields work together to provide a number of features for improving an application. Typically, we recommend that you use the name of the variable and an (.IO) extension for these files so that when you review the files in a directory making them easy to identify.

The Input file is used to provide a default value for a variable when the Add screen is presented. It can be from a previous entry of other sources like Scales or PLC's. The Output file can be used to store the current value of a variable from the Add screen – in the case of a default value or to share the value with a different QW Application.

Refer to the following Self Help entries for more details on these files.
http://www.busitech.com/Using-Input-and-Output-Files/
http://www.busitech.com/How-do-I-create-a-default-value-in-Quality-Window/

Unit of Measure: Pick from a list of available Units of Measure that matches the variable you are creating. The Unit of Measure is for documentation and reference purposes only. It is only displayed in the Variable Information Screen. The Unit of Measure pick from list can be changed in the QWAdmin – Unit of Measure option.

Report Type: affects the way that some statistics are calculated for this variable to make them more accurate for a given situation.

- Variable – Normal calculation – **default setting**
- Variable Target Range – used to define a variable that the target value is a range rather than a specific number.
    - used to modify the way Target Z is calculated
    - Used with the Warning Limits if they are Fixed
        - If the average is between the warning limits Target Z =0
        - If the average is above the warning limits Target Z=+1
        - If the average is below the warning limits Target Z=-1

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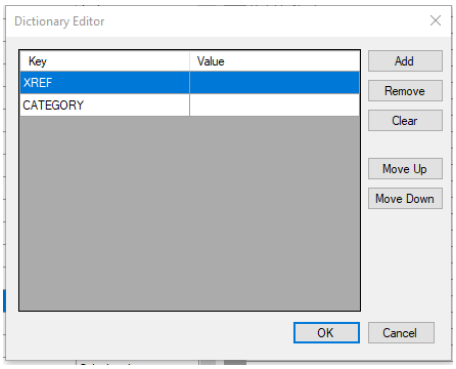
    - Calculated or Blank warning limits - Target z set to n/a
- Attribute Measureable – used for variable that has a grading scale like opacity
    - Disables calculation of Cr, Tz, Ppk and Cool
- Attribute Count 1-50 – inspection group size
    - Modifies the calculation of the %OOL
        - Average/Sub-group size * 100
    - Disables calculation of Cr, Tz, Ppk and Cool

Note: See Calculating Statistics in QW6 for more details

Reference Fields - (includes Category/X-Ref fields from QW5): All fields defined or contained in this list are not used internally in QW 6. They are provided so that it can be used to assist application developers as required. For instance, it can be used to identify the cross-reference name for this variable to another database. They can be used to group variables in a QW application for external reporting needs. You can create your own reference fields as required. Contact Busitech for details on specific use of these reference fields.



You may not have a need now for them, but they are available if needed in the future.

Help File:
You can create a Help file for each variable in a QW6 application that can provide single click access to information about a variable. This could be information to assist in the understanding of issues related to this variable and how to correct them. By placing the filename and extension of a file in this field, it will tell QW 6 to display the contents of that file using the Windows Default viewer for that file type. If you use a .DOC, Windows will use Word to display the document. For .XLS, it will use Excel.

It is a very powerful tool for providing Current Best Approaches (CBA's) for solving problems quickly and in a consistent manner.

N-Numeric (no Limits or Rules) - Run Number Field

This type of variable is used to capture numeric type data like a run or order number. Using Blank Limits will display the values in black. Charting and use of Control Rules will be disabled.

If there were text or special characters to be included in this field, then a Text type variable would be used – example (123-34AB7). In our application the Run Number will have a numeric value entered like (223543).

Note: A variable set to numeric will have leading zeros suppressed. So, if this variable is to be a tracking number like a Run Number and it can have leading zeros, make the field T-Text

Here is how to proceed:

- Set the field length to meet your expected data
- Decimals = 0
- Report type = Variable
- Unit of Measure – ignore
- Sampling Plan – 1 if you expect it every time
- Calc. Limits based on – ignore
- Centered on Target – ignore
- Max Value – set it based on your highest possible value. Good error check
- All Limits set to Blank
- Min value – set to lowest possible value or zero. Good error check
- Set all rules to off – clear check marks
- Input/Output Files – set to RunNumber.io if you want a default value. Useful if the same run number is used for multiple entries, otherwise leave blank.
- Category/X-Ref – leave blank
- Help file – if you have a help file enter filename here.

C-Calculated – Average Bottle Weight

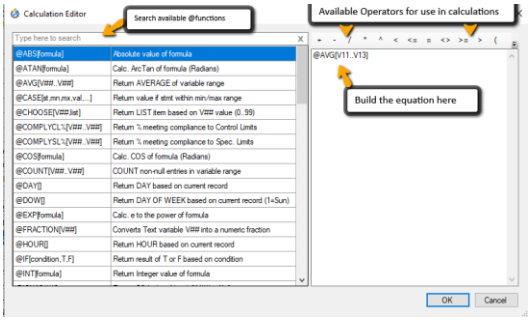
Calculated variables in QW 6 are like free data. There is no cost in terms of time or effort to get results but they add tremendous value and insight to a QW 6 application.

A calculated variable is defined almost the same as a numeric variable (see Numeric Variable for details) with the exception that the value of calculated variable is not entered but is derived from a formula.

Calculated variables do not appear on the Add or Edit screens. Their values are only determined when the data is saved.

A formula can be very simple or quite complex and can be comprised of:

- use other Variables using their V-reference number – Example V17 to represent Product Weight
- numerical operators like +-*/
- parentheses () to control the order of events
- pre-programmed functions identified by using an @ and square brackets []



Simple Calculated variable:

- A value of 15. Using this type of calculated variable would result in a constant value of 15 for the variable. This can be handy if you want to have the number identified in the data so when you bring data together from two production lines, you can see the source of the data.

Using Variable reference numbers

- V16+V17

Using parentheses ()

- (V16+V17)/V23

@ Functions

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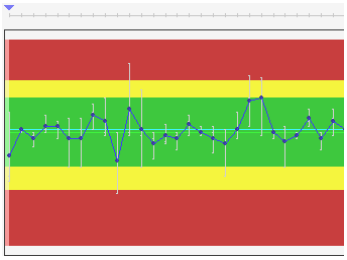
- @AVG[V16..V23,V26]
- Calculates an average value of the variables V16 through V23, including V26
- @CASE[@HOUR[V2]+(@MINUTE[V2]/60),7.50,15.49,10,15.50,23.49,20,23.50,24.00,30,00.00,7.49,30]
- Determines the value of a Shift code based on the current time.

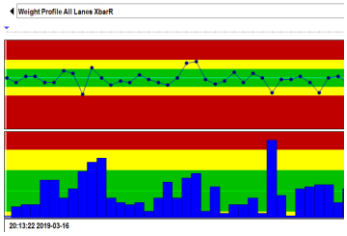
There are a number of @Functions available to you when you define a calculated variable in QW6. You can explore the list of available @Functions in the Formula builder Window when you click on the Formula tab in the definition screen for a Calculated Variable.

A couple of special @Functions are:

- @POP[V15..V17] – produces a custom chart view of the Average value for all data contained in these three variables as well as a range line in the Control chart indicating the highest and lowest value of the variables selected. The histogram and the Statistics will be for the combined data of the three variables selected.

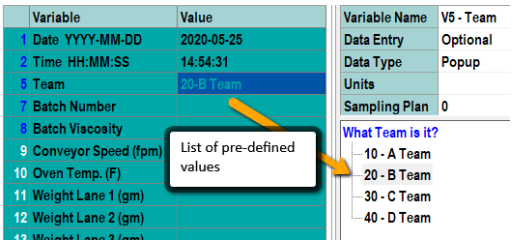


- @XBar[V11..V13] – produces a true XBarR chart for the variables selected including a Range chart which can be displayed as bar chart of line chart.



P-Popup – Team Variable

A P-Popup field lets you ask a question and then provide a list of possible answers. This makes the capturing of data fast, accurate and consistent. There are three types of Popups you can use in a QW 6 application:



- A single level - one question one answer
  - What Team is it? A, B, C or D
- A single level - one question but with associated data
  - What Product are you making? Deluxe 32oz
  - Associated with the Deluxe 32oz selection are additional pieces of data like:
    - Plastic bottle
    - Model 332 Screw cap
    - SKU 12345
    - Green Label
  - Once the selection of product is made – Deluxe 32oz, then all the associated data can be included in a QW 6 application through the use of L-Lookup type variables
- A multi-level Popup – multiple related questions to drill down to the right answer
  - What Area of the Line caused the Stoppage?
    - Mixer
    - Conveyor
    - Filler
    - Packager

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- If Mixer is selected, then the questions would be Reasons for Stoppage?
  - Electrical
  - Mechanical
  - Operational
- If Electrical is selected, then only the Causes for Electrical failures for the Mixer are displayed
  - Power Outage – Source
  - E-Switch hit – operator stop
  - Motor failure
- You are led to the best answer based on the number of questions you ask.
  - Mixer
    - Electrical
      - Power Outage – Source
      - E-Switch hit – operator stop
      - Motor failure

This in turn allows you to analyze your failures based on the questions to ask when it happens:

What area of the Machine had the most failures?
What Reason (discipline) had the most minutes down?
What's the biggest Cause of failure in terms or Events, Minutes or Cost?

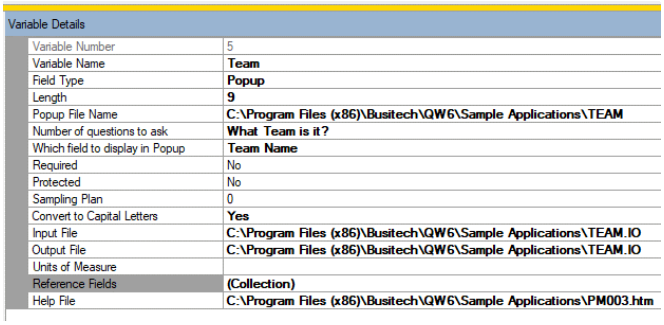
All in all, Popups and their associated data can add tremendous value to a QW 6 application while greatly decreasing the time it takes to collect the data.

Here is some information on creating Popups.
http://www.busitech.com/Lets-Talk-Popups/
Video Tutorial: https://busitech.com/tutorials/managing-popups/

Note: Popups must be created using QWAdmin – Popups, before they can be included in a QW 6 Application. So, once you decide to use a Popup, you must create it first.

Refer to the Quality Window 6 Sample Applications for examples of how Popups are used. Typically, they are installed in the Busitech/QW60/Sample QW Applications directory.

Defining a Popup Variable



Field type – Popup
Length – must in include 2 digits for each level a dash as a separator and the description.

Example:
10-A Team length = 9
102015-Broken bearing = 6 for the code 1 for the dash and length needed to display the description (15) = 22

Popup file name: Picked from list of available Popups
Number of Questions to ask: One for every level of the popup

Example:
Team is One level = one question

Root Cause is three levels = 3 questions – 1 -What Area? 2-What Reason 2- What Cause

What field to display: Picked from the Popup in the Team variable there is only one Team Name

Example: In a Popup file with multiple companion data fields you can select the most relevant.

Required/Protected/Sampling Plan/Input Output files see Numeric Variable definition

Reference Fields: Blank

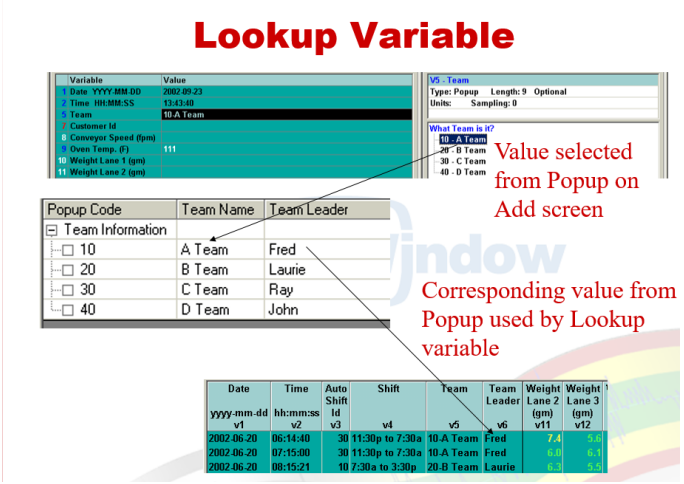
Help: see Numeric Variable definition

L- Lookup– calculated text fields

A L-lookup type variable is a calculated text field. It uses a value from another variable as a key to a Popup Selection file to obtain Popup Fields information.

A L-lookup variable does not appear on the Add, Edit, Insert, Copy screens. Its value is only determined when the Save button is clicked on the Add, Edit, Insert, Copy screens.

Good examples of using Popup and Lookup variables are in the example applications included with QW 6.



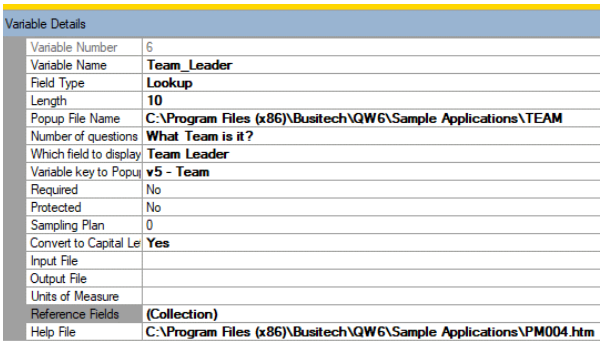
In the Process Monitoring Example:

- Shift Id and Shift Description are good examples of a Calculated Shift Id used in a Lookup field to a Popup to get a description
- Team and Team Leader – example of a single level popup with associated data.

In the Downtime/Production Tracking Example:

- Downtime Type – example of a single level popup
- Downtime Area, Reason and Cause – 3 level popup
  - Where the Cause is the Popup field – P type field is always on the lowest level
  - Area and Reason fields are Lookup type variables using the code captured in the Cause field.

Defining a Lookup Variable:



Field Type: Lookup

Length: The length of the description you want to display on the Logsheet.

Popup File Name: Select Popup from list that contains the data you wish to display. (see Diagram Above)

Number of Questions: Depends on number of levels in the popup and at what level you want a description for.

Variable key to Popup: A lookup requires a numeric value to use as a key to a Popup to retrieve the requested data. The variable selected here could be the P-Popup variable that selected data from a

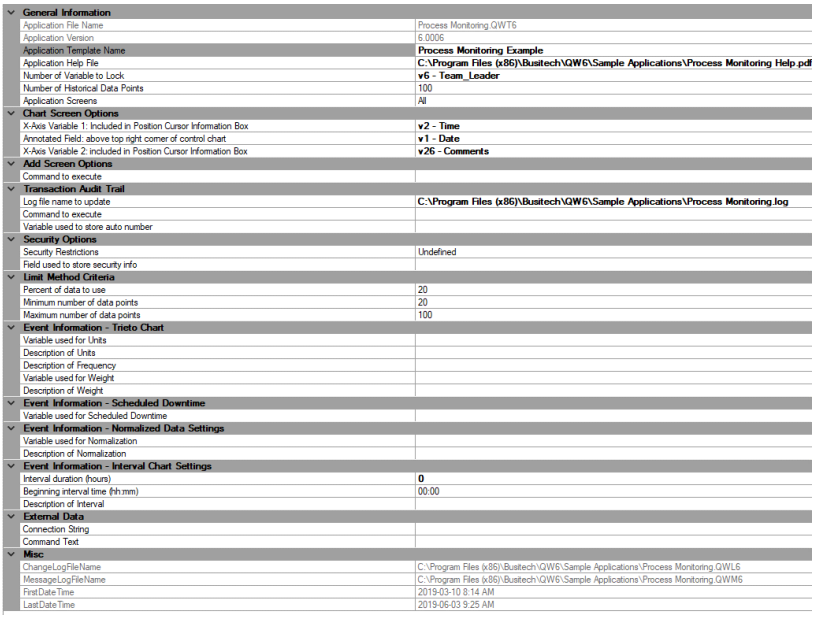
Popup file. This key can then be used to retrieve additional companion data to be included in the application. Another option could be a C-Calculated Variable that can be used as a key. The Auto Shift Id variable in the Process Monitoring Application is an example of this.
Required/Protected/Sampling Plan/Input Output files and **Reference Fields:** leave Blank
Help File: see Numeric Variable definition

QWAdmin – Applications Settings

Once you have created all your variables for your QW6 Application, it is then time to enter the QWAdmin Applications General View Settings screen and complete the process.

General View:

The settings in this section offer several customizing features for adapting your application to better meet the use of the application.



General Information	
Application File Name	Process Monitoring.QWT6
Application Version	6.0006
Application Template Name	**Process Monitoring Example**
Application Help File	**C:\Program Files (x86)\Busitech\QW6\Sample Applications\Process Monitoring Help.pdf**
Number of Variable to Lock	**v6 - Team_Leader**
Number of Historical Data Points	100
Application Screens	All
Chart Screen Options	
X-Axis Variable 1: Included in Position Cursor Information Box	**v2 - Time**
Annotated Field: above top right corner of control chart	**v1 - Date**
X-Axis Variable 2: included in Position Cursor Information Box	**v26 - Comments**
Add Screen Options	
Command to execute	
Transaction Audit Trail	
Log file name to update	**C:\Program Files (x86)\Busitech\QW6\Sample Applications\Process Monitoring.log**
Command to execute	
Variable used to store auto number	
Security Options	
Security Restrictions	Undefined
Field used to store security info	
Limit Method Criteria	
Percent of data to use	20
Minimum number of data points	20
Maximum number of data points	100
Event Information - Trieto Chart	
Variable used for Units	
Description of Units	
Description of Frequency	
Variable used for Weight	
Description of Weight	
Event Information - Scheduled Downtime	
Variable used for Scheduled Downtime	
Event Information - Normalized Data Settings	
Variable used for Normalization	
Description of Normalization	
Event Information - Interval Chart Settings	
Interval duration (hours)	**0**
Beginning interval time (hh:mm)	00:00
Description of Interval	
External Data	
Connection String	
Command Text	
Misc	
ChangeLogFileName	C:\Program Files (x86)\Busitech\QW6\Sample Applications\Process Monitoring.QWL6
MessageLogFileName	C:\Program Files (x86)\Busitech\QW6\Sample Applications\Process Monitoring.QWM6
FirstDateTime	2019-03-10 8:14 AM
LastDateTime	2019-06-03 9:25 AM

Application File Name:

This is the actual filesystem name that the application was saved as.

Application Version:

Each time a QW6 Application is saved after making changes in QWAdmin the Version Number is automatically incremented by one. The version number will be displayed in QW6 and is a good reference number for tracking changes to a QW6 application.

Application Template Name*:*

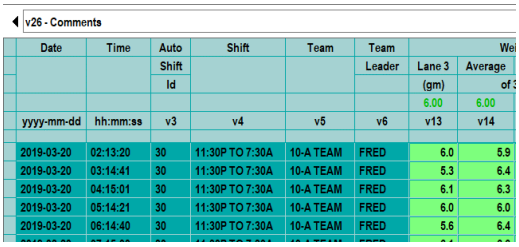
Used on the Open Application screen and can be the same name as the Application File Name. The File name and the Application name can be different. Having a longer Application Template name allows for a more descriptive name to be displayed on the Open Application Screen.

Make it meaningful, easy to understand and consistent.
Example:

- Downtime Line 6
- Line 6 - Product X Size 4 Quality

Created: Aug 3, 2020
Revised: Feb 2, 2022

- Line 6 Process checks



v26 - Comments

Date	Time	Auto Shift Id	Shift	Team	Team Leader	Lane 3 (gm)	Average
						6.00	6.00
yyyy-mm-dd	hh:mm:ss	v3	v4	v5	v6	v13	v14
2019-03-20	02:13:20	30	11:30P TO 7:30A	10-A TEAM	FRED	6.0	5.9
2019-03-20	03:14:41	30	11:30P TO 7:30A	10-A TEAM	FRED	5.3	6.4
2019-03-20	04:15:01	30	11:30P TO 7:30A	10-A TEAM	FRED	6.1	6.3
2019-03-20	05:14:21	30	11:30P TO 7:30A	10-A TEAM	FRED	6.0	6.0
2019-03-20	06:14:40	30	11:30P TO 7:30A	10-A TEAM	FRED	5.6	6.4

Number of variables to lock*:*

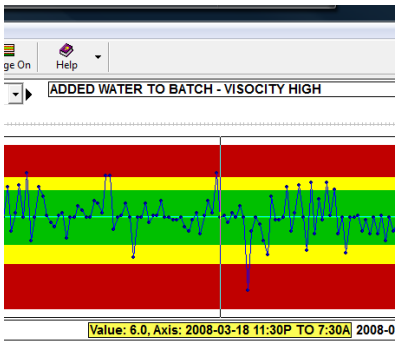
(Default 2 Date/Time) This will set the number of variables from the left to keep locked (frozen) in place when scrolling to the right on the Log Sheet screen. It is a good idea to organize the order of the variables in the application to ensure variables like Shift Team and Leader stay locked in place for easy reference on the Logsheet. In the example notice that Team Leader is V6 and the next one to the right is Weight Lane 3 V13. V7 through 12 have scrolled to the left leaving the first 6 variables locked in place.

Number of Historical Data Points*:* (Default 100)

When a QW 6 Application is selected from the Open screen, QW 6 looks to this field to determine the number of records that should be loaded into memory starting from the most recent, backwards this number of data points. The number of records loaded is also the basis for calculating statistics that appear in the statistics box on the Chart type screens as well as the data used to calculate any limits that are set to Calculated for any of the variables in the application.

Note: Setting this value to ALL will load all records in a QW 6 Application file. It is not recommended to have this value set to ALL for regular use as it may cause slow performance on loading. At any point in the QW6 program, you can access the Filter screen and load additional records if required.

Chart Screen Options*:*



These are options that allow you to customize the Control Chart in QW 6 add value to the data displayed. It is recommended you set these options

X-Axis Variable 1 Included in the positional Cursor Information Box:

- Located on to the right of the Value displayed inside of the yellow information window under the Control chart. This information window appears when the left mouse button is pressed while pointing at a value on the control chart.

X-Axis Variable 2 Included in the positional Cursor Information Box:

- Located on to the left end of the yellow information window under the Control chart. This information window appears when the left mouse button is pressed while pointing at a value on the control chart.

Annotated field: Above top right corner of the control chart:

- Select a variable from the application that you wish to display the value for as you move the Positional Cursor on the Control Chart.
- A good use of this option is a variable like a Comment variable that will display the comment entered for a record in the QW Application. This makes this field a useful problem solving tool when investigating issues to understand what has happened in the past.

Add Screen options*:* **(Optional) –** scripting interface user exits

This option tells QW 6 to perform a task when the A-Add screen is selected. It is an opportunity to interface with prior to the add screen being presented. These interfaces can be to devices like digital scales or external data source like databases or automation systems (PLC's)

Batch filename to Execute**: (Optional)**

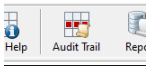
This is the name of a command type file that will perform a function external to the QW6 application. You can navigate to the location on your computer where this command type file is located.

Transaction Audit Trail**:**

This group of options is performed when the Save key is pressed in QW 6. It provides will update a transaction log file containing every Add, Edit, Copy, Insert or Delete of data made in a QW 6 application. This is great options for meeting the traceability requirements of your data, especially for regulated products like pharmaceuticals.

Log filename to update**:**

The name of file, by default name of the Application data file with .LOG extension, where the transactions will be stored.



Note: The Transaction Log File Viewer in QW 6 can be selected by clicking on the Audit Trail icon at the top off the QW6 screen.

Command File to Execute**: (Optional)**

This is the name of a command type file that will be executed on the Save of the data on the Add screen. You can navigate to the location on your computer where this command type file is located. An example of how you might use this option may be to update data in another database based on the data entered in the current QW 6 Application.

Variable Used to store AutoNumber*:* **(Optional)**

QW 6 can create a unique number or id for each record of data collected. This number is very useful in the tracking of data as well as providing a Key like value to be used to synchronize data between two data bases. Another use of Auto number is to detect missing or deleted records.

To make use of this feature, select a variable from the application to store this AutoNumber in. It should be a numeric value and then set to Protected so the value cannot be edited.

Security Options*:*

These options are used to identify what functions (Add, Edit, Insert, Copy and Delete) should be restricted. To allow the capability to be performed by a User they would have to the capability enables through their security settings defined for them.

Video Tutorial: https://busitech.com/tutorials/managing-security/

Limit Method Criteria*:* In the calculation of limits in QW 6 (Specification, Control and Warning) there is a setting called Low and High Variation. If one of these methods are selected, QW 6 will use the criteria set here to scan the data for the requested state of Standard Deviation (high or Low). It is recommended that you use the default settings for these fields (20, 20, 100).

Here is an overview of the calculation of limits in a QW 6 application:
http://www.busitech.com/Getting-the-most-out-of-your-Control-Limits/

Event Application Information*:*

Need a little help getting started

There are two primary types of applications that QW 6 can be applied to.
They are:

- Regular Timed Interval for Sampling – it uses Specification, Control and Target limits along with Control rules to monitor a product or process – this document covers this type of application.
- Event based – record data when something happens - downtime, defects, scrap. These types of applications typically record data like:
    - Measures of severity – Minutes down, costs or products rejected
    - Descriptive data like root cause, shift, product and customer to permit the ranking and filter of data for analysis.

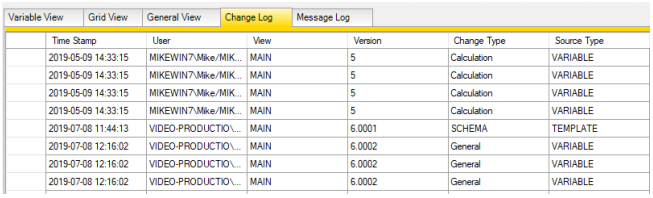
For the type of application we created in this document, the Event Information options would not be used.

External Data:

These options are typically not used for regular QW 6 applications. They are used when a QW 6 Application obtains data directly from an external database through the use of a Connection String and a SQL Statement. We called these types of Applications "On the Fly" applications as they are created at the time the query is made and the elements in the SQL Statement become the variables in the QW 6 application. The QWSQLWizard utility, found in the QW 6 program directory, would be used to create the initial Connection string and SQL statement.
Video Tutorial: https://busitech.com/tutorials/sql-wizard/

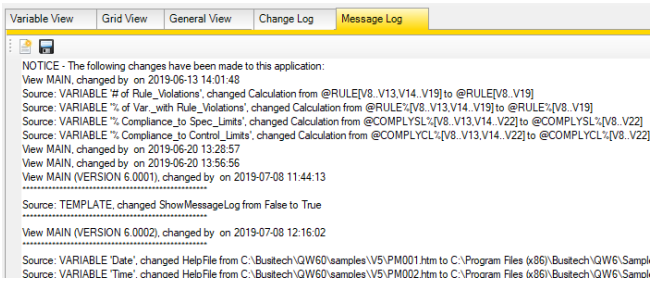
Miscellaneous Application Information:

ChangeLogFilename: This the name and location of the file that stores all changes made to a QW6 Application template. It acts as an audit trail when changes were made and by whom. It can be viewed via the Change Log Tab



Time Stamp	User	View	Version	Change Type	Source Type
2019-05-09 14:33:15	MIKEWIN7\Mike/MIK...	MAIN	5	Calculation	VARIABLE
2019-05-09 14:33:15	MIKEWIN7\Mike/MIK...	MAIN	5	Calculation	VARIABLE
2019-05-09 14:33:15	MIKEWIN7\Mike/MIK...	MAIN	5	Calculation	VARIABLE
2019-05-09 14:33:15	MIKEWIN7\Mike/MIK...	MAIN	5	Calculation	VARIABLE
2019-07-08 11:44:13	VIDEO-PRODUCTIO\...	MAIN	6.0001	SCHEMA	TEMPLATE
2019-07-08 12:16:02	VIDEO-PRODUCTIO\...	MAIN	6.0002	General	VARIABLE
2019-07-08 12:16:02	VIDEO-PRODUCTIO\...	MAIN	6.0002	General	VARIABLE
2019-07-08 12:16:02	VIDEO-PRODUCTIO\...	MAIN	6.0002	General	VARIABLE

MessageLogFilename: This the name and location of the file where information can be stored and edited to advise users the changes made to the application. This could be an alert to revised limits or additional variables added to the application. The QWAdmin Application Maintenance tool will post changes made to the application but the contents of the file can be edited by the Application Administrator. The contents of this file are displayed when the application is selected on the Open application screen. It can be viewed via the Message Log Tab. There is an option to turn notice of these changes off in the Option settings in QW6.



First/Last dates: These are the first and last dates from the application datafile and provided as reference only.

Develop it – Last step: Test and Show the application you created

As you try your application, you will probably find small issues that you will wish to change. Things like moving variables around or adding and even deleting variables. The QWAdmin tool provides you with a rapid change capability that allows you to easily make these changes.

It is important to try out the application and share it with others to make sure it meets all the objectives it was intended for. Do not be afraid to show it off and expect comments. The rapid change capability means you adjust the application quickly, but it also helps to get "buy in" from the people who will use it when you make changes based on their comments.

Deploy it!

So, you have Designed, Developed and Tested your QW 6 Application…now what do you do?

You now need to deploy your application to the workstations that will use the application. This means you need to install the Quality Window 6 product on that workstation that will need it. You may need assistance from your IT resources at this point. Here is an outline on how to proceed.

Deploy it – the final statement!

The final comment is one of the most important after you have Designed and Built your applications. **What is the backup strategy you need to put in place and ensure the valuable data you are collecting is protected?** This backup strategy should include when backups are done and verifying all the necessary files are backed up.

The answer to when (once a shift, once a day, once a week) is up to you.
Answer this question – how much will it hurt if you lost a shift/day/week of data? Once you answer this you will know how often you should be doing a backup of the data. Remember, there may also be regulatory requirements for maintaining your data that need to be considered as well.

It should be noted that each time a QW 6 application is revised using the QW6Admin module a backup or archive of the application is automatically saved in a directory called QWArchive located under the current application directory.

Video Tutorial: https://busitech.com/tutorials/archiving-and-restoring-applications/

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