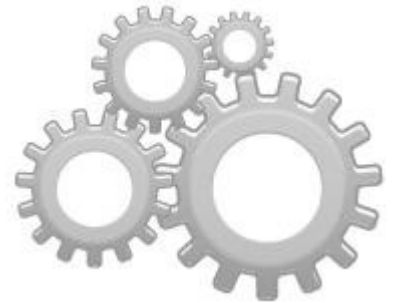




## Automating Data Collection

***A guide to selecting the right solution and configuring the QW6Schedule Utility***



# Automating Data Collection

## Selecting the right solution:

Quality Window helps you to unlock the power of your data. Imagine how much more powerful your data would be if you could collect more information, more often and more accurately.

To maximize the use of automation data it is important to understand and pick the right solution to meet your needs. The Quality Window Product line provides two solutions and picking the right one is important. Let's step through an outline of those two solutions to help you make the right decision. Understand that you can contact us at any time to help you in this process.

First, the two alternatives for collecting Automation data (DDE/OPC) are:

- Option 1: Using QW6Schedule communicating directly through an I/O Server to an Automation System – The IO server is not included with the QW6 product
  - Ideal to meet small data collection requirements
  - 10 or fewer data points (tags) at a time
  - Downtime Tracking
  - Supplementing manual data collection through Add data screen
- Drawbacks:
  - 1 I/O Server required per workstation requesting data
  - May require NetDDE and or DCOM connections depending on the configuration
- Option 2: Using QW6DataHub – a managed gateway to all your automation data. This is a separate product from QW 6 at an additional cost
  - Ideal High volume (number of tags) and rapid requests for data
  - Supports multiple QW Applications at a time – plant wide
  - Single source of all Automation data
  - Decreases need for multiple IO Servers
  - Secure managed access to automation data

Both solutions do make use of the QW6Schedule utility available in the QW 5 product. The difference in the two solutions is the interaction and efficiency of dealing with different Automation Systems.

**Note:** Both solutions require IO Servers to communicate with an Automation System. These I/O Servers are not included with QW 6 or QW6DataHub but can be purchased from the Automation System provider or third-party sources.

**Special Note:**

# Automating Data Collection

If you are using the RSLinx product as a Provider, it is recommended that you use the QWDataHub solution. Providers, like RSLinx, typically expect connections to be opened and kept open for long periods. If RSLinx is flooded with single requests (opening and closing communications) at a rapid rate the communication link stalls and the I/O Server, which communicates with RXLinx would have to be restarted and may cause the loss of data.

The remainder of this document will deal with the setup and configuration of the QW6Schedule Utility, QW6Schedule may be used in either option you select the only differences would be in the source of the actual data. Using the QW6DataHub option you would be using the tags defined in the QWDataHub application. If you are using Option 1 then the addresses will be the Automation (PLC) addresses accessible directly through the I/O Server.

## Overview of the QW6Schedule Utility in Quality Window 6

### A Fast and Simple Way to Collect Data Automatically

In the past, solutions used to automate data collection were complex, expensive, time consuming and inflexible...often requiring specialized IT resources to create and manage the system on an ongoing basis. Even small applications would require the use of expensive, dedicated servers to collect data for their client applications.

Busitech has made a breakthrough in providing simple yet flexible tools to integrate and automate data collection. These tools are designed to provide the *"rapid change capability"* that you have come to expect using Quality Window. Users can create very flexible solutions in a timely fashion, without the need for specialized and expensive resources. In small applications, data collection can even be done directly within the workstation...avoiding the cost and maintenance of dedicated servers.

Perhaps the best news is the fact that these tools are included with the latest version of Quality Window 6... at no additional cost!

## Introducing QWSchedule

QW6Schedule is a stand-alone utility you can select from the QW6Admin module and you can use it can define and schedule tasks that include asking Quality Window to automatically collect data from several different sources.

# Automating Data Collection

The "data" can be any Microsoft DDE/OLE/OPC compliant information available anywhere on the network or directly wired to your computer. This can include data within other commercial databases, PLCs, Test Instruments, etc.

QW6Schedule can run tasks that collect data on either a regular timed interval and/or event basis. An example of the regular timed interval would be to collect data once an hour, or once a day, whereas an example of the event-based collection would be when a trigger value is detected, such as in the case of when a machine stops (downtime). QW6Schedule works in the background, independent of regular QW6 users.

When QW6Schedule is started the first time it automatically places itself in the System Tray in the lower right. Just click on the icon and it will appear on your screen. Simply select the Task option in the top left and you are ready to create a Scheduled Task.

## Creating Different Tasks

QW6Schedule allows you to create and save several different tasks and gives you considerable flexibility in defining the options for each particular task.

There are two distinct types of tasks that can be created and used in QW6Schedule:

- a **Scheduled Task**, which is used to make something happen on a regular timed basis, for example, once a minute, once an hour or once a day.
- an **Event-Based Task**, which is based on a trigger value that indicates that something has happened, and it is time to perform a specified action.

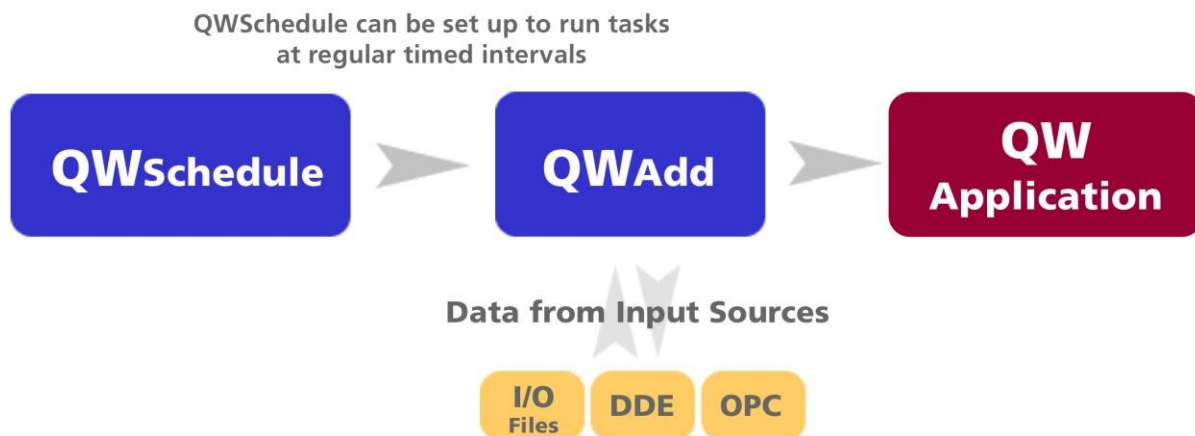
The variations on these two groups of tasks are endless, and therefore the opportunities to use QW6Schedule are limited only to your imagination. Typical examples include:

- Capturing process data with each manual quality check
- End of shift snapshot of downtime/scrap/reliability/production
- Automating labs
- Capturing upstream information (such as making, materials, etc) with downstream information
- Capturing process data with each downtime event,
- Background data collection of process data

# Automating Data Collection

- Collection of environmental data such as temperature, humidity, etc, etc.

QW6Schedule allows you to automatically run any process that is currently available in Quality Window. This includes adding data to an existing QW Application using the QW6Add feature. Data can be added on a regular timed interval and/or event basis.



You can also use QWS6chedule to archive data (copy and delete) from an active QW application file to a historical file using QW6Utilites Move. Another example would be to set-up an automatic data backup procedure to run at a specific time each morning (e.g. 1:00 AM).

In the following pages, we will explore the following topics:

- Creating a Scheduled Task
- Creating an Event-Based Task
- Creating a Downtime Task
- Defining Input Sources in a QW Application

## Creating a Scheduled Task to Automatically Collect Data

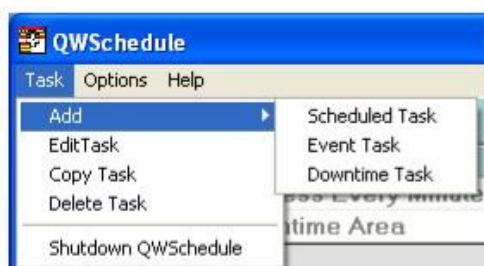
Perhaps the most powerful use of QW6Schedule is to collect data directly from devices like Programmable Logic Controllers (PLC's) and update a QW6 application data file without operator intervention. Instead of having a person standing at the computer and pressing the Add key every 30 minutes to obtain the data we can have QW6Schedule do it automatically for us.

# Automating Data Collection

The basis of automating data collection with the QW6Schedule program is the use of the QW6Add feature in Quality Window. A key component of the process is the use of Input/Output (I/O) File definitions for variables within a QW 6 application. Defining Input/Output (I/O) Files are explored later in this article, and for now, we will concentrate on simply creating a task to Automatically Collect Data.

The following is an example of how you would create a new Scheduled Task to collect data and set it to execute once every minute.

Click on the QWSchedule Icon in the System Tray to launch QWSchedule.



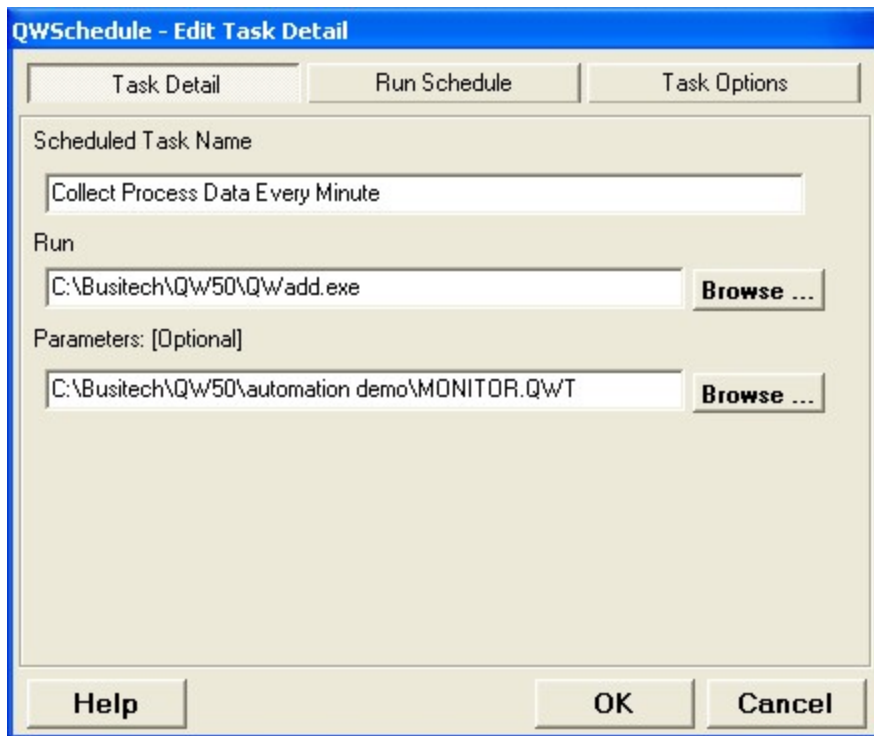
Select the Task option in the top left and then choose to Add a Scheduled Task.

## Define the Task

Now we just need to supply the necessary information. We use the Edit Task Detail screen to give the task a meaningful name.

We must also establish what program is to be run. In this example, we want to run the QW6Add program in Quality Window.

# Automating Data Collection



Every time the QW6Add program is run, it will scan the appropriate QW Application template for Input File Sources.

- *This action is equivalent to pressing the Add key in QW5, then Save, then Exit*
- *Records are ReOrganized (ReOrged and ReCalced) after every QW6Add*

Input File Sources, explained in greater detail at the end of this paper, are where the data will be sourced that QW6Add will write to the QW6 Application template.

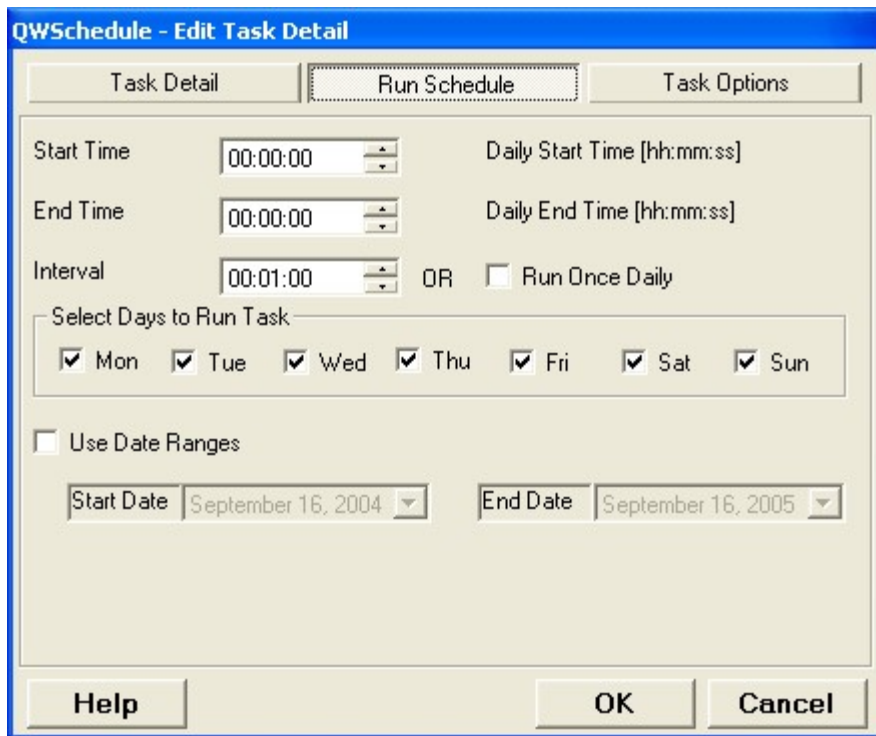
Finally, you need to establish the Parameters for the Task, and in this example, that means identifying which QW6 Application the new data will be added to.

Selecting the Browse option for either Run or Parameters will allow you to navigate to the appropriate directories to make selections.

## **Establish a Schedule**

We now need to tell QW6Schedule when and how often to run this particular Task. This is done by selecting the Run Schedule tab.

# Automating Data Collection



**QWSchedule - Edit Task Detail**

Task Detail | **Run Schedule** | Task Options

Start Time: 00:00:00 Daily Start Time [hh:mm:ss]

End Time: 00:00:00 Daily End Time [hh:mm:ss]

Interval: 00:01:00 OR  Run Once Daily

Select Days to Run Task

Mon  Tue  Wed  Thu  Fri  Sat  Sun

Use Date Ranges

Start Date: September 16, 2004 End Date: September 16, 2005

Help OK Cancel

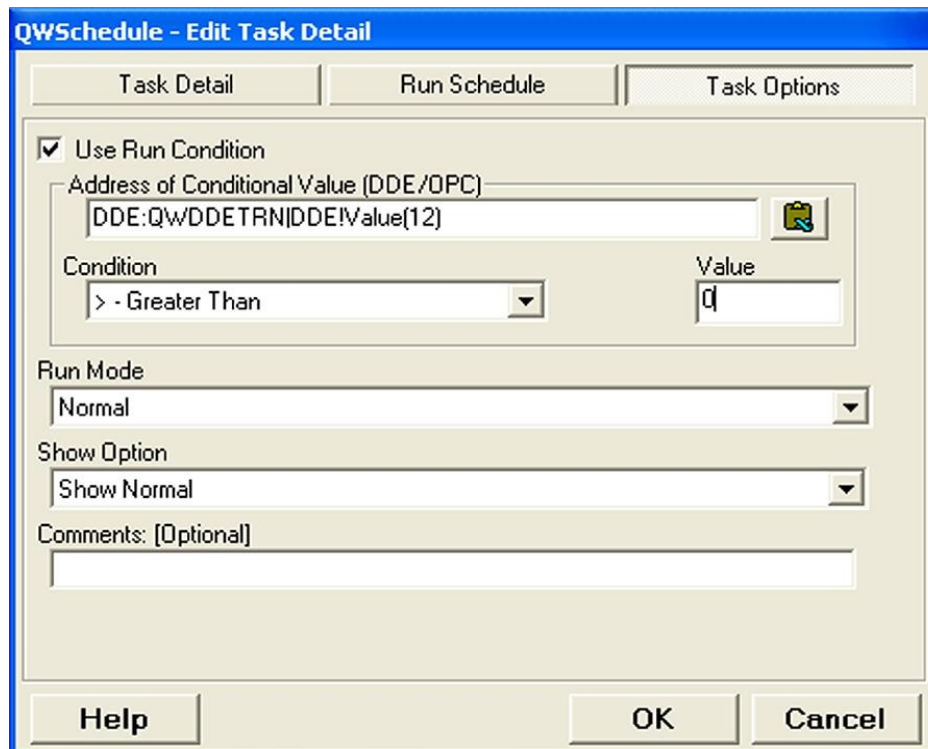
For our Task we are only interested in an Interval of 1 minute and that we want it to run Monday through Sunday. As you can see you can get very precise in the running of a Task. For example, we could set a Task to run between 7 am and 11 pm Monday through Friday and by using the Date Range option at the bottom just run it for September through December this year.

## Fine Tune the Options

Our last job is to view the Task Option screen. This screen lets you specify any special options when running this Task. For instance, the Show Option lets you control what is displayed on the screen when the program in the Task Detail-Run option is executed. The pull-down menu lets you select from Normal, Maximized, Minimized, or Hidden views. The Run Mode defaults to Normal unless a problem in running the Task is encountered and then the Special option can be tried to overcome the problem. Comments are optional and this allows you to provide any information you consider important for this Task.



# Automating Data Collection



The Run Condition options add a very useful capability for controlling individual Tasks. You can specify an address in the Address of Conditional Value in conjunction with the Condition and Value fields that you want QW6Schedule to check before actually executing the Task. This will help you avoid writing blank records to a QW6 Application when the Equipment/Line is not currently running. Another example might be you only want to collect data if the speed of the line is above a certain value.

When you have finished setting all the options just select OK and the Task will be saved.

## Activating a Task

To activate a Task, just click in the checkbox beside the Task in the QW6Schedule Status Window. Existing tasks are colour coded to display their status:

<b>Green</b>	Task is active
<b>Yellow</b>	Task is running
<b>Red</b>	There is a problem with the Task ( <i>e.g. the DDE/OPC source is not available</i> )
<b>Grey</b>	Task is currently inactive

# Automating Data Collection

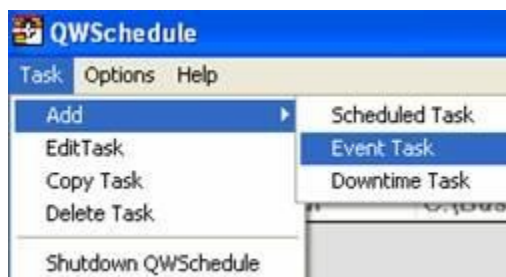
## Creating an Event-Based Task

There are two variations of Event Tasks available in QW6Schedule. The first is based on a trigger value and when that value changes it is time to perform a specified action. This could be a value in a PLC that indicates the end of a shift has occurred and it is time to run the end of shift report.

In the following example, we want to run an End of Shift Report when the shift changes.

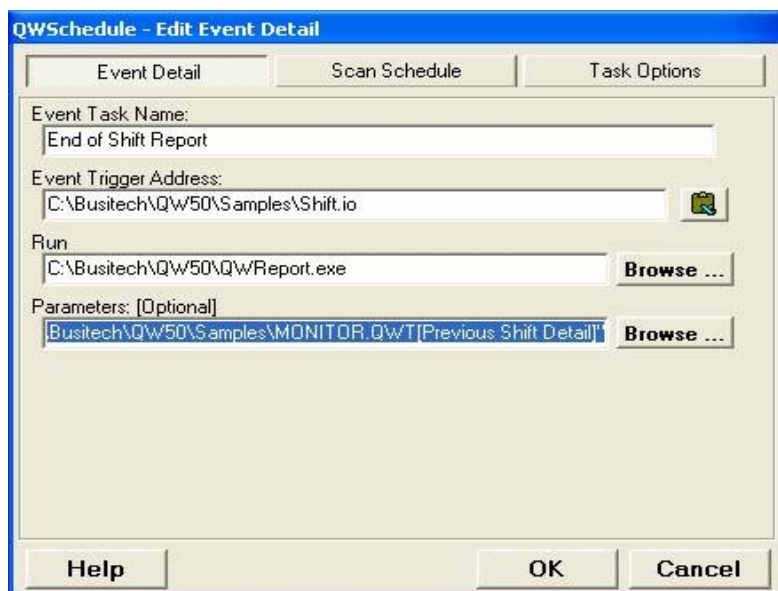
Click on the QWSchedule Icon in the System Tray to launch QW6Schedule.

Select the Task option in the top left and then choose to Add an Event Task.



### Define the Task

We use the Edit Task Detail screen to give the task a name that clearly indicates what the task is for. In this case, we will name the task “End of Shift Report”.



## Automating Data Collection

In the next field, you define the Trigger Address. This can be a DDE or OPC address in a PLC or as in this case a QW6 Input/Output file called Shift.IO.

In this example, you have designed your QW application with a field to note which shift is working. When a new shift begins, the first task of the shift leader is to add a record in the QW6 application noting the change. QW stores that value in an Input/Output file called Shift.IO. The IO Files continues to store this value until the next shift starts when a new value would be recorded.

QW6Schedule will continue to monitor this file and when the file changes the Task will be triggered. You must provide the complete location information for the file to ensure the correct file is being monitored.

*C:\Busitech\QW6\Samples\Shift.io*

Once the Task is triggered you need to define what action you want QW6Schedule to take. In the Run field, you specify the program or activity you want to be performed. In this case, we want to run the program QW6REPORT.EXE, which is located in the Busitech/QW6 directory on the C: drive. The Browse option to the right of the field can make this selection easier.

*C:\Busitech\QW6\QW6Report.exe*

Along with specifying the program, some options can be specified to clearly define the task you want to perform. These options are sometimes called command-line options and in this case, we want QW6REPORT.EXE to run a report for the Monitoring application and specifically we want the “Previous Shift Detail” Report to be printed on the default printer.

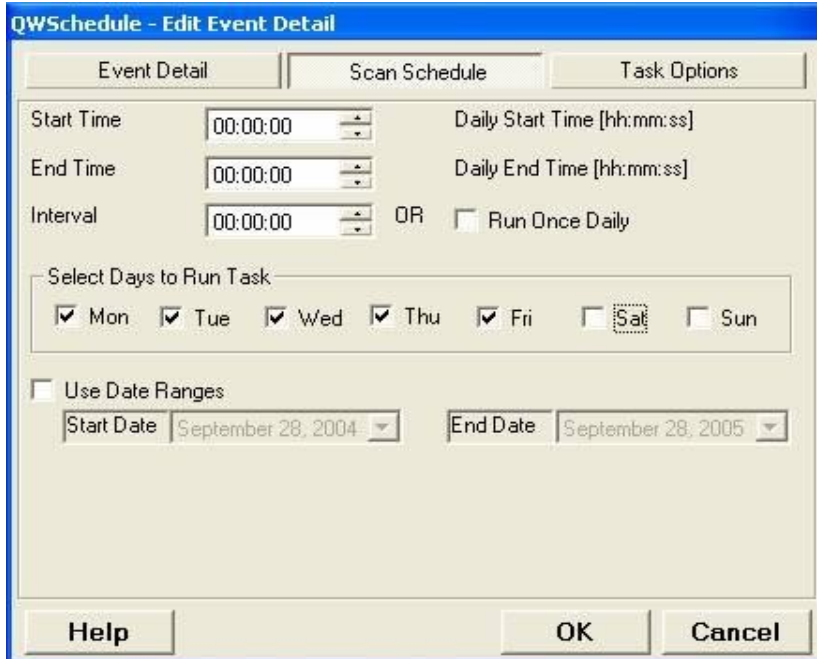
*PRINTER C:\Busitech\QW6\Samples\MONITOR.QWT[Previous Shift Detail]*

Each program you place in the Run option may have a variety of command-line options. You should investigate these options to select the best method of accomplishing your objective.

### **Establish a Schedule**

We now need to tell QW6Schedule when and how often to run this particular Task. This is done by selecting the Scan Schedule tab.

# Automating Data Collection

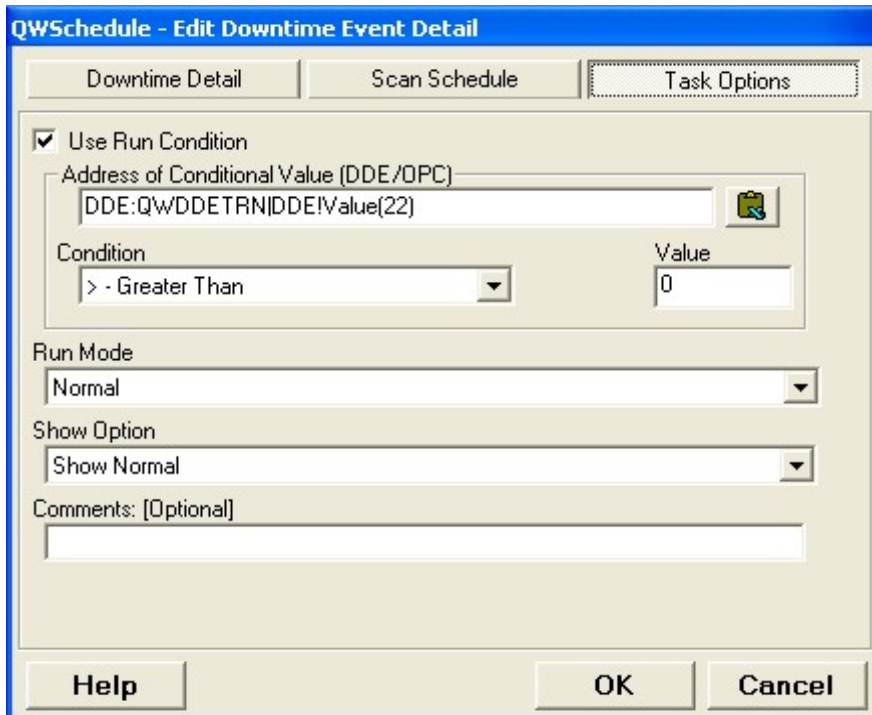


This screen allows you to clearly define when this task should be available to be executed. For instance, in this example, we know we only run a 5 day a week operation so we only want the task to be available Monday through Friday.


# Automating Data Collection

## Fine Tune the Options

The last option screen for you to consider is the Task Option screen.



The screenshot shows the 'Task Options' tab of the 'QWSchedule - Edit Downtime Event Detail' dialog box. It features three tabs: 'Downtime Detail', 'Scan Schedule', and 'Task Options'. The 'Task Options' tab is active and contains the following fields:

- Use Run Condition
- Address of Conditional Value (DDE/OPC):  
- Condition:  (dropdown menu)
- Value:
- Run Mode:  (dropdown menu)
- Show Option:  (dropdown menu)
- Comments: [Optional]

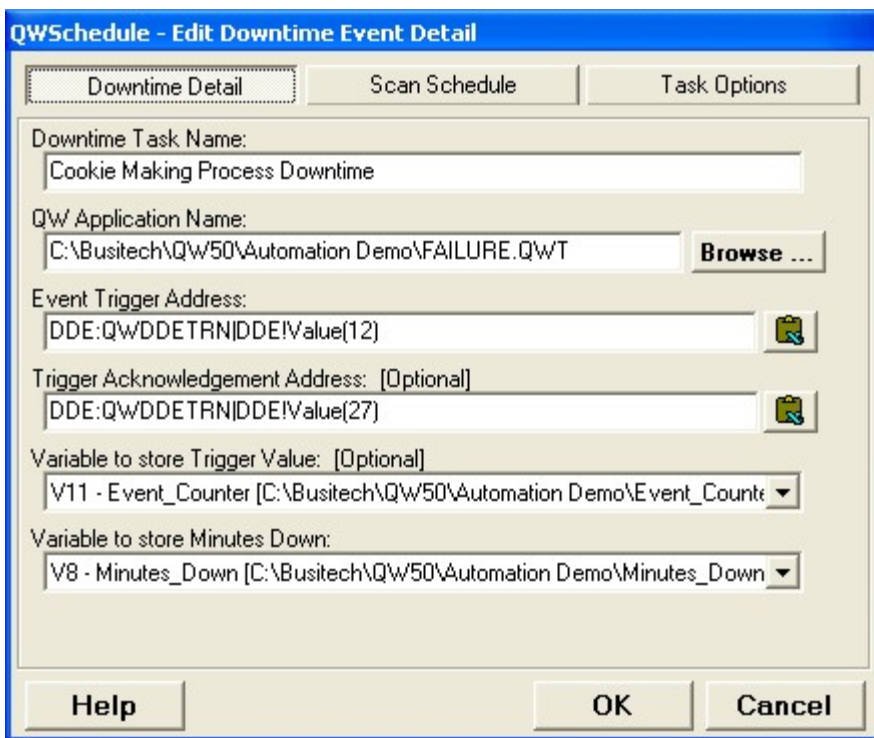
At the bottom of the dialog box are three buttons: 'Help', 'OK', and 'Cancel'.

Here you can set the Task to only run if a certain condition is met (Use Run Condition). This is useful if it is important that this task only run if the Line is currently running. In other words, you do not want the Task to run if the Line is currently on a Maintenance shut-down.

You can also set how the task is to be displayed on the screen when it is executing. You may not want anything to show on the screen.

## Creating a Downtime Task

The second type of Event task is also trigger-based but the first change in a value starts a timer and the second stops the timer and then performs an action. This type of Event task is ideally suited to track downtime for a piece of equipment or manufacturing line.





**QWSchedule - Edit Downtime Event Detail**

**Downtime Detail** | Scan Schedule | Task Options

Downtime Task Name:  
Cookie Making Process Downtime

QW Application Name:  
C:\Busitech\QW50\Automation Demo\FAILURE.QWT **Browse ...**

Event Trigger Address:  
DDE:QWDETRNIDDEIValue(12) 

Trigger Acknowledgement Address: [Optional]  
DDE:QWDETRNIDDEIValue(27) 

Variable to store Trigger Value: [Optional]  
V11 - Event\_Counter [C:\Busitech\QW50\Automation Demo\Event\_Counte]

Variable to store Minutes Down:  
V8 - Minutes\_Down [C:\Busitech\QW50\Automation Demo\Minutes\_Down]

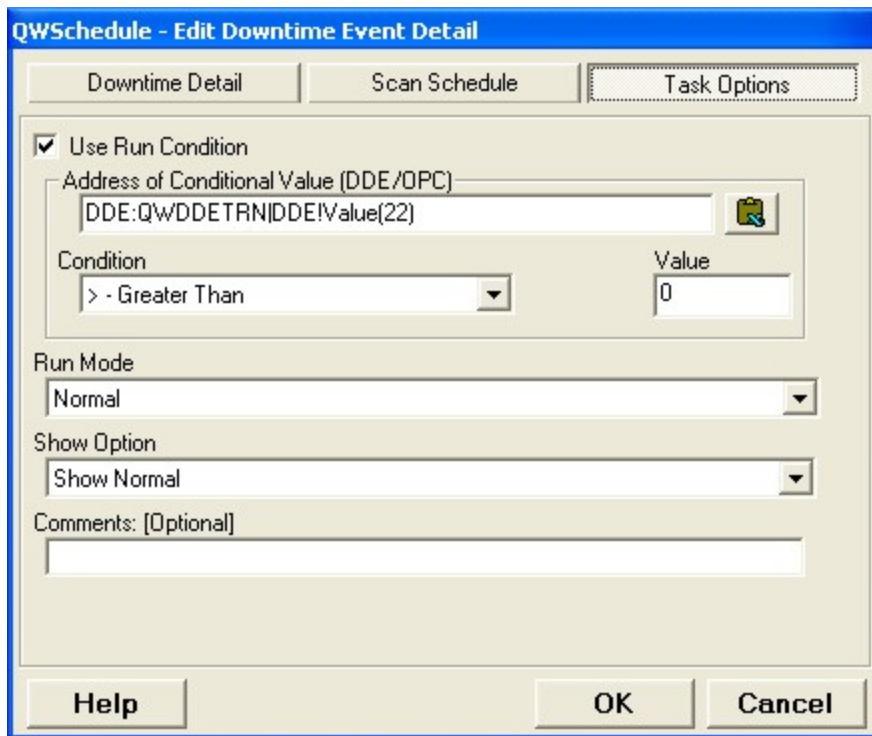
**Help** | **OK** | **Cancel**

The key to this type of Event Task is the **Event Trigger Address**.

QW6Schedule will monitor this address to detect a change. Once a change is detected QW6Schedule will start a timer. When QW6Schedule detects the field has changed values again the QW6 Downtime application will be updated with the downtime information.

The **Trigger Acknowledgement Address** is optional and is used to send back to a specified DDE or OPC address the value of the Event Trigger, indicating that QW6Schedule has completed processing that downtime event. It is a form of handshake that helps to maintain communication between the PLC and QW6Schedule

# Automating Data Collection



## Defining Input Sources in a QW Application

As noted above, QW6Schedule calls on the QW6Add feature in Quality Window to automatically collect data. For QW6Add to successfully collect data, one or more variables within the specified QW Application template must have an Input File specified for it. The Input File tells the QW6Add process what value to establish for that variable in the record that is about to be written. Every variable within a QW template can have an Input File specified for it.

The following notes explain how you can define Input Sources in a QW application.

### Getting Started

Input Files can be specified for each variable using the QW6Admin program.

Choose which existing QW Application you wish to modify, and then use QW6Admin to modify each necessary variable.

Input Files can be specified with 3 different sources: a simple Input/Output (I/O) file, a Dynamic Data Exchange (DDE) address, or an Open Process Control (OPC) address.

# Automating Data Collection

## I/O Files

Quality Window allows you to set up a simple data file to collect input/output data. These files are called I/O Files. You can specify an I/O file as the input source, such as:

C:\busitech\QW6\samples\team.io

□ where a single value may be stored within this file

I/O input files are typically used to receive data from RS232 devices like a weight scale.

## Dynamic Data Exchange (DDE) address

You can specify a DDE application source file as the input file, such as:

DDE:EXCEL|c:\MyWorksheet.xls!R1C3

- where Excel is the DDE application
- where c:\MyWorksheet.xls is the spreadsheet file
- where R1C3 is Excel's way of pointing to Cell C1 (Col 3, Row 1)

To gain access to PLC sources a bridge is required (called an IO Server). These servers are typically software gateways supplied by Control System suppliers like Allen-Bradley, Siemens, or Honeywell. These IO Servers receive the data request from QW 6 and then talk to the Control System to supply the data.

## Open Process Control (OPC) address

You can specify an OPC application source file as the input file, such as:

OPC://Server1/ICONICS/BatchViscosity

- where Server1 is the name of the server (computer)
- where ICONICS is the name of the OPC Server Application
- where BatchViscosity is the item or tag name

When QW6Add requests data for a particular variable through an Input File source, the current data value from the file, DDE, or OPC location is retrieved and used as the variable value for the new record is added.



# Automating Data Collection

Prefix	Description	Input	Output	Format
DDE:	Read value from DDE Server	Y	Y	DDE:AppName TopicName! TagName
OPC:	Read value from OPC Server	Y	Y	OPC://Node/ProgID/TagName
HUB:	Read value from QWDataHub (Local)	Y	Y	HUB:TagName
TCP:	Read value from QWDataHub (Remote)	Y	Y	TCP:Address:Port! TagName
FIX:	Read value from iFix Server	Y	N	FIX:TagName
DNA:	Read value from eDNA Server	Y	Y	DNA:TagName
DIO:	Read value from an ADU Digital I/O device	Y	Y	DIO:ModelNo SerialNo!Command
CON:	Sets a constant value	Y	N	CON:ConstantValue

## More Information

More information on Quality Window 6 and its associated features can be found on the Busitech website at [www.Busitech.com](http://www.Busitech.com), where you can also download a full working version.

Alternatively, you can contact the Busitech support team via e-mail [Support@Busitech.com](mailto:Support@Busitech.com)