Reference Guide
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OpenEnterprise OPC Server Reference Guide (V2.83)

Remote Automation Solutions

Website: www.EmersonProcess.com/Remote

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1 OpenEnterprise OPC Server

The OpenEnterprise OPC Server, which conforms to the OPC Foundation Data Access Version 1.0A and V2.05A standards, provides both an asynchronous and synchronous data interface to the OpenEnterprise Server database.

It is capable of being optimized for the handling of Controlwave device signals, and can be used by any OPC Client complying with OPC Data Access standards.

It can connect to one or more OpenEnterprise databases to provide data requested by OPC clients. The Bristol OPC Server user interface also supplies diagnostic information at database, OPC Group and OPC Item level. Finally, it provides an on board tag browser to allow the user to view and monitor any valid OPC Tags known to the Bristol OPC Server.

1.1 Client-Server Application Architecture

Most OpenEnterprise View components (e.g. Alarm View, Alarm Printer View, Trend View, OEGraphics View, Notes View) have what is known as three-tier Client-Server architecture. Each of the components listed above is a Client, which uses one or more Server components to provide them with the data that they request. This data is then displayed by the Client to the user. In turn, the Server component requests the data from what is usually a remote OpenEnterprise data source (Database Management System) running on an OpenEnterprise server. The Server component, is therefore a direct client of the OpenEnterprise database, but a Server of the OpenEnterprise View component (hence the term "three-tier"). Both Client and Server components must run on the same workstation, but the database usually runs on another machine.

1.2 Pre-Starting Server Components

All Server components are started automatically as a background process when a Client component starts up. They then close when the Client closes, except for the OPC and HDA Servers, which remain open by default. However, this can cause problems when Client components are being opened and closed rapidly. It is therefore recommended that Server components be started before any Client components begin requesting data from them. Obviously, if a Client component is not required, then the Server component is not required. The following are the Server components that should be started on an OpenEnterprise workstation before any of their 'Clients' begin running: -

- The Bristol OPC Server (Clients = OEGraphics and Trend View)
- The Bristol HDA Server (Client = Trend View)
- The Alarm Server (Clients = Alarm View, Alarm Banner)
- The Alarm Printer Server (Client = Alarm Printer View)
- The Notes Server (Client = Notes View)

These components reside in the OpenEnterprise bin directory (by default *C:\Program Files\Bristol\OpenEnterprise\bin*). They are executables, and may be started in any of the ways that an executable file is started (e.g. double clicking, batch file, Startup menu).

1.3 AutoTerminating OPC and HDA Servers

By default, the OPC and HDA Servers remain open when a calling Client closes.

This behaviour can be changed using the OpenEnterprise Settings Editor. Open the Settings Editor, and find the OpenEnterprise\Tasks\AlarmPrinterServer key. Then look for a value on this key named *AutoTerminate*. If one is not there already, create one, and set the data to 1.

To set the Server back to normal behaviour (i.e. to remain open when the Client closes) set the value data back to 0 (zero).

1.4 Maximum Update Rate

It is possible to define a global maximum update rate at which the OPC Server reports changes in value to a registered OPC Client, regardless of the update rate requested by the client. This functionality enables the OPC Server to control the frequency with which data is reported to Clients.

The maximum update rate, in milliseconds, can be defined using the Settings Editor. Find the *OpenEnterprise\Tasks\BristolOPCServer*, and look for the *MaximumUpdateRate* value. If the value does not exist, create it, then set the data to the required value (note the data value represents milliseconds).

A minimum data value of 50 milliseconds is enforced by the OPC Server.

1.5 Designating and Defining Tag Timestamps

An optional time column can be specified for an OPC Tag, such that the specified time column attribute value is used to provide the timestamp reported to an OPC Client with any change of value for the attribute value defined by the OPC Tag. This allows the timestamp associated with any OPC data sourced from remote telemetry systems to be propagated through OpenEnterprise, and onto third-party OPC Clients.

To define a time column for use with an OPC tag the following (optional) argument should be added to the end of an existing OPC Tag definition:-

```
[."timecolumn:<columnname>"]
```

where <columnname> is the name of a datetime column within the source table defined by the OPC Tag.

For instance the following OPC Tag,

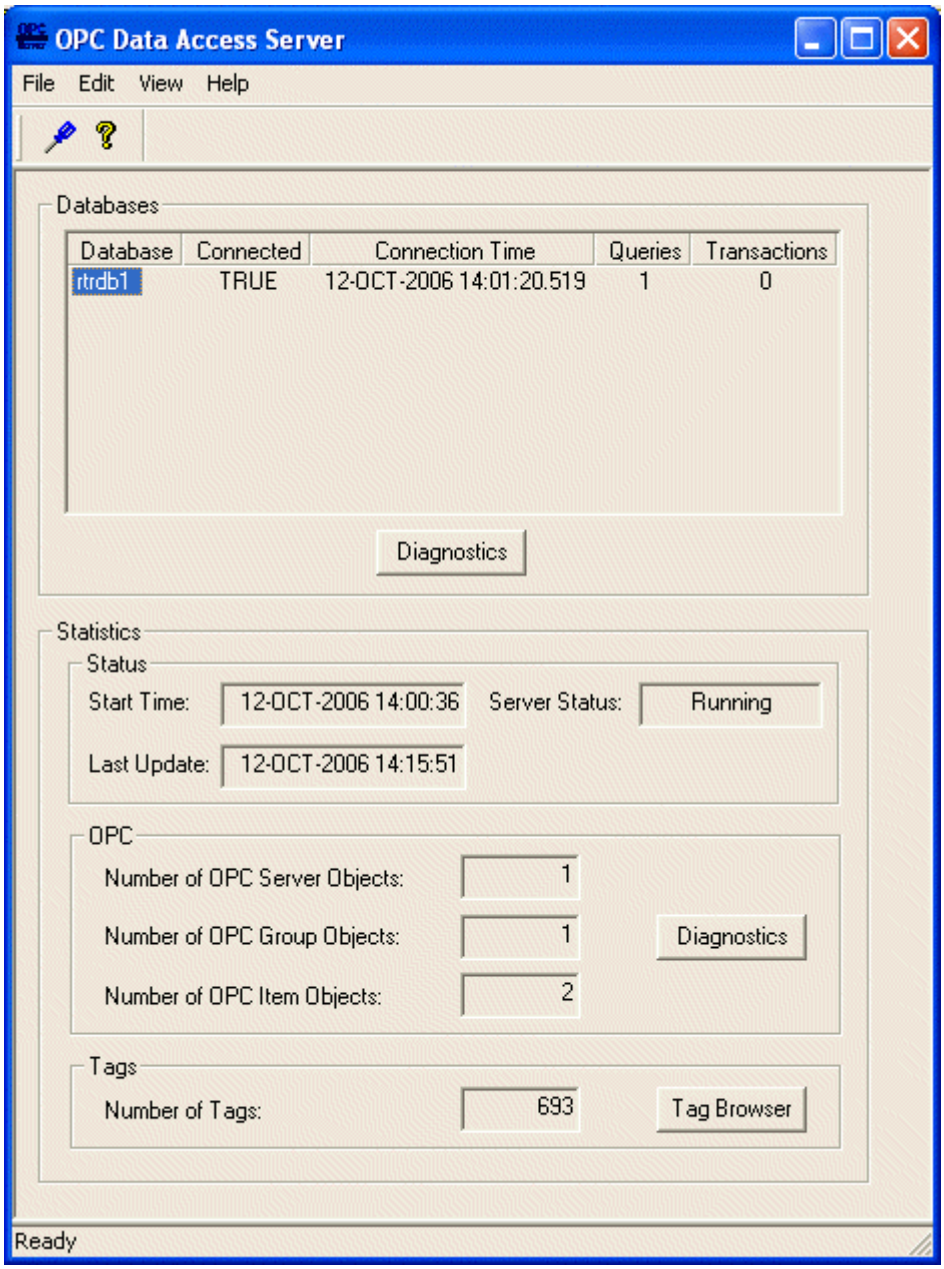
```
"rtrdb1"."nw3000realanalog"."name:varchar:X386:ANA.TPL.001"."value:float"."
timecolumn:alarmtimestamp"
```

would indicate that the current value of the *alarmtimestamp* attribute value for the NW3000RealAnalog signal named X386:ANA.TPL.001 would be supplied whenever the value of that signal changed and was reported to the OPC Client.

Note: No validation of the defined timecolumn will be made by the OPC Server. If an invalid column is defined, i.e. a non DATETIME column, or the column name doesn't exist for the associated table, then the timestamp associated with the OPC Tag cannot be trusted and it is also possible that data may not be returned for the OPC Tag itself.

2 Main Dialog

The Bristol OPC Server Main Dialog provides diagnostic information on database connections, OPC objects and tags retrieved, as well as providing the ability to configure the Bristol OPC Server.



2.1 Database List

The Database List provides information concerning the OPC Server's connection with the configured OE database(s).

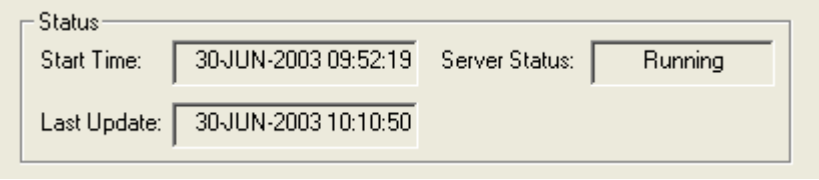
2.2 Database Diagnostics Button

This button becomes enabled when a database is selected from the Database List.

When the button is selected, it opens the Query and Transaction Diagnostics dialog.

2.3 Status Section

This section provides general health information on the current state of the Bristol OPC Server.



2.3.1 Start Time

When the OPC Server was started.

2.3.2 Server Status

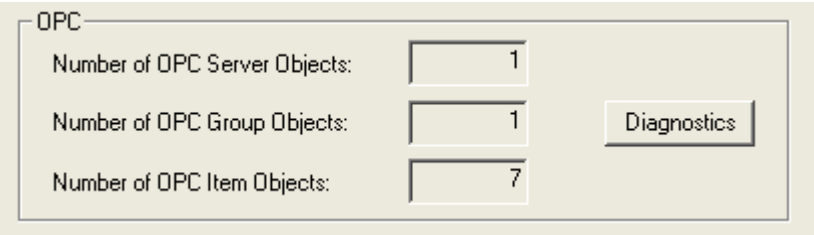
The status of the OPC Server.

2.3.3 Last Update

The time at which the last set of data changes were reported to any connected OPC Clients.

2.4 OPC Section

This section displays a count of OPC Server, OPC Group and OPC Item objects, as well as providing access to a Dialog which allows the user to browse and obtain diagnostic information relating to OPC Client(s) requests for data.



It is important not to confuse the OPC Server objects described within this section with the physical OpenEnterprise OPC Server. An OPC Server object is created by an OPC Client to allow it to add OPC Groups and OPC Items, and therefore request specific tag data. It is perfectly feasible (and usual) that at any particular time the OpenEnterprise OPC Server may have multiple OPC Server Objects to manage.

2.4.1 OPC Server Objects

The number of OPC Server objects being managed currently by the OPC Server.

2.4.2 OPC Group Objects

The number of OPC Group objects currently being managed by the OPC Server.

2.4.3 OPC Item Objects

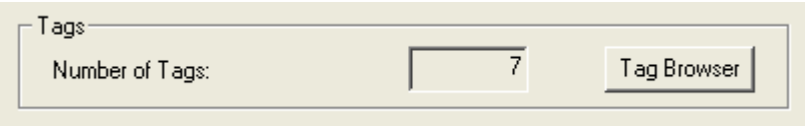
The number of OPC Item objects currently being managed by the OPC Server.

2.4.4 OPC Diagnostics Button

This button is enabled if the Bristol OPC Server is managing any OPC Server objects. It allows the user to invoke the OPC Server Diagnostic dialog.

2.5 Tags Section

This section of the Main Dialog provides information on the tags which the OPC Server can make available to any Clients.



2.5.1 Number of Tags

The total number of tags the OPC Server has knowledge of. This can be due to specific requests for OPC Items by OPC Clients, or because the OPC Server has pre-queried the list of available NW3000 signals from any connected databases.

2.5.2 Tag Browser Button

Selection of this button invokes the Tag Browser dialog.

2.6 Main Dialog Menu Bar

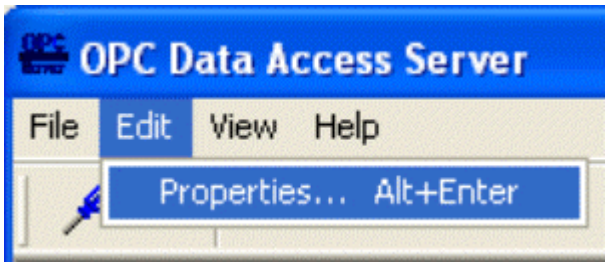
There are four items on the OPC Server's menu bar:-

2.6.1 File

There is only one option - to Exit from the Bristol OPC Server.

2.6.2 Edit

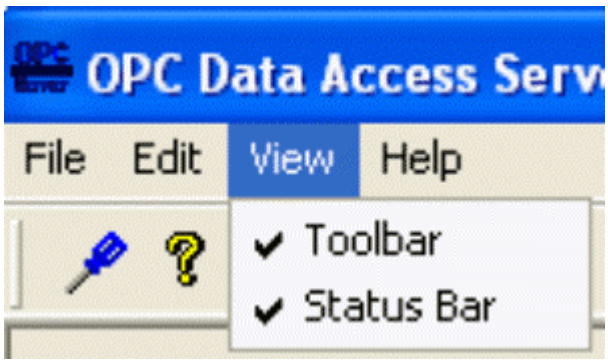
The Edit Menu gives access to the Properties Dialog for the Bristol OPC Server. The Properties Dialog enables the user to change the display settings for the OPC Server and to add or remove Dataservices that the OPC Server will attempt to connect to automatically when it runs.



The 'Properties' option can be disabled by setting the data on the *DISABLEPROPERTIES* value to 1 on the *OpenEnterprise\Tasks\BristolOPCServer* key using the Settings Editor.

2.6.3 View Menu

The View menu enables the visibility of the Toolbar or Status bar to be toggled.



2.6.3.1 Toggle Toolbar

When checked, the Toolbar is visible. This is the default behaviour. Clicking on this item when checked will remove the tick. The Toolbar will then not be visible. Toolbar visibility can be enabled when this menu item is unchecked by selecting the option again.

2.6.3.2 Toggle Status Bar

When checked, the Status bar is visible. This is the default behaviour. Clicking on this item when checked will remove the tick. The Status bar will then not be visible. Status bar visibility can be enabled when this menu item is unchecked by selecting the option again.

2.6.4 Help

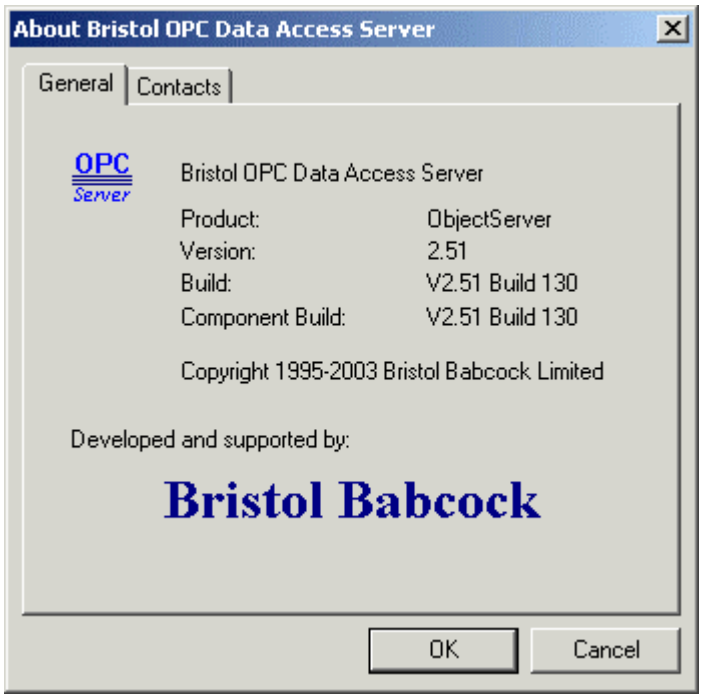
The Help Menu provides access to this Help file and also to the About Box.

2.6.4.1 Context Sensitive Help

Selection of this button or menu option will open the OPC Server's help file at the appropriate topic.

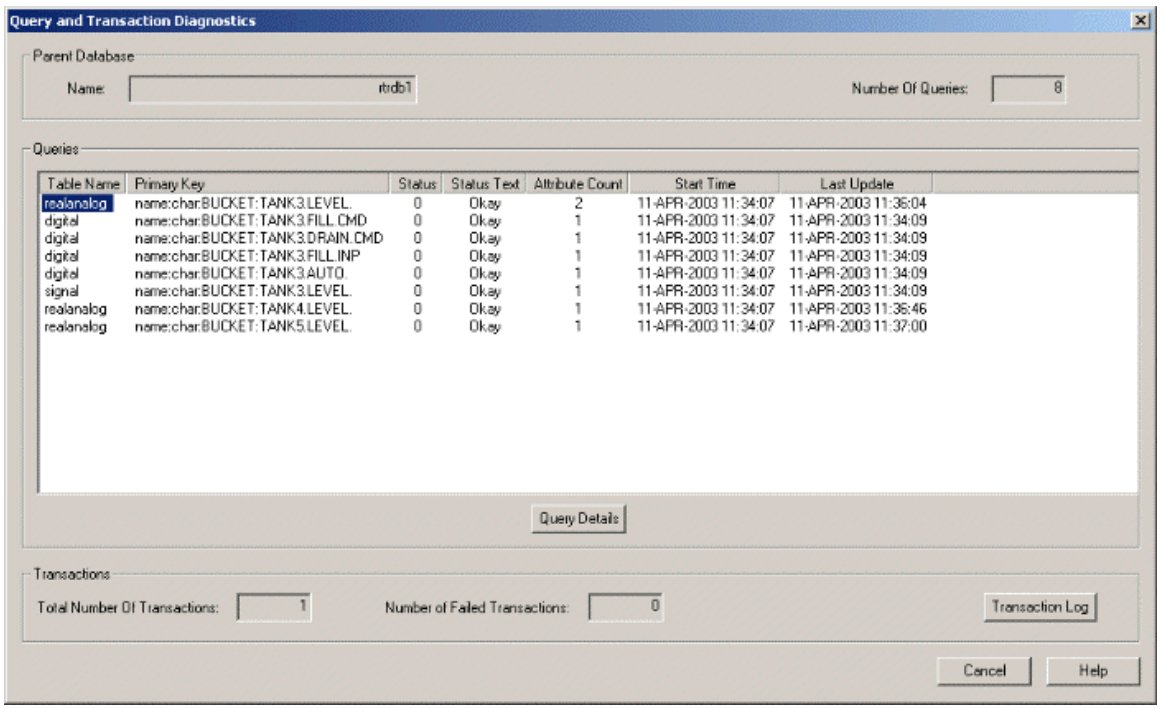
2.6.4.2 About Box

The About Box provides useful information about the product version and build being used, and also Contact numbers.



3 Query and Transaction Diagnostics

This form is accessed from the Database Diagnostics button at the top of the OPC Server's Main Dialog. It displays the status of all active queries the OPC Server has started in order to satisfy the requirements of any OPC Clients.



3.1 Database Name

The name of the database selected from the Main Dialog.

3.2 Number of Queries

The number of Queries currently made to the selected database.

3.3 Query List

This list displays the list of Queries made to the database.

3.4 Table Name

The name of the table queried.

3.5 Primary Key

The Primary Key of the object being queried from the table.

3.6 Status

The status of the query as an integer. 0 (zero) means a successful query. The Status Text column gives a textual explanation of the Status code.

3.7 Status Text

The status of the query given in textual form.

3.8 Attribute Count

The number of attributes retrieved by each query.

3.9 Start Time of Query

The time when the query was started.

3.10 Last Update of Query

The time at which a change of value for any attributes contained within the query last occurred.

3.11 Query Details Button

This button is enabled if a query is selected from the Query list. It enables the user to invoke the Query Attributes dialog.

3.12 Total Number of Transactions

The total number of transactions made with the selected database. A transaction is defined as an insertion, an update or a deletion of an object within the database.

3.13 Number of Failed Transactions

The number of failed transactions.

3.14 Transaction Log Button

Selection of this button will invoke the Transaction History dialog.

3.15 Cancel Button

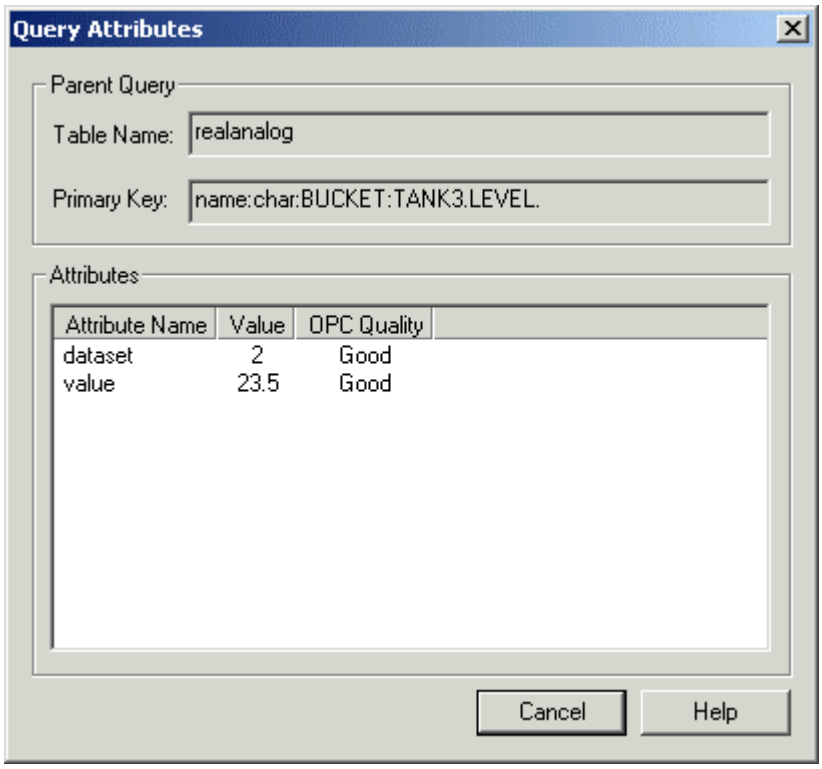
Selection of this button will close the dialog. If it is a dialog where configuration changes can be made, the changes will not be saved.

3.16 Context Sensitive Help

Selection of this button or menu option will open the OPC Server's help file at the appropriate topic.

3.17 Query Attributes

This dialog enables the user to further determine any problems with individual queries. The values shown are a snapshot taken when the dialog is invoked and are not updated in realtime.



3.17.1 Attributes List

The list of attributes retrieved by the selected query.

3.17.2 Attribute Name

The name of the database attribute.

3.17.3 Attribute Value

The value of the database attribute.

3.17.4 OPC Quality

The OPC Quality of the retrieved data. This may be any of the permitted OPC Data Access quality values, with additional settings available for NW3000 signal attributes - see the NW3000 Signal Quality Attributes section for more details.

3.17.5 NW3000 Signal Quality Attributes

As long as the 'GetAdditionalNW3000Attributes' value of the

`OpenEnterprise\Tasks\BristolOPCServer`

key in the Settings Editor is set to non-zero, OPC Quality within the Bristol OPC Server is set by the reading of the Questionable attribute of Network3000 Signals. Below is a table giving the relationship between these factors and the meaning of each possible value of the Network3000 Questionable bit expressed in terms of OPC Quality.

Bit	Meaning	OPC Quality
0	The Signal value is questionable within the RTU.	Uncertain, with Sub-status of Non-Specific.
1	Data Collection Failure, (template collection only).	Bad, with a Sub-status of Last Known Value.
2	RTU is offline.	Bad, with a Sub-status of Last Known Value.
3	Analog Value has been corrected (rdi3000 receives a value that is Not A Number, so marks the value as Questionable)	Bad, with a Sub-status of Non-Specific.
4	Bit unused	Bad, with a Sub-Status of Out of Service.
5	Version mismatch in RTU	Bad, with a Sub-Status of Last Known Value.

3.17.6 Cancel Button

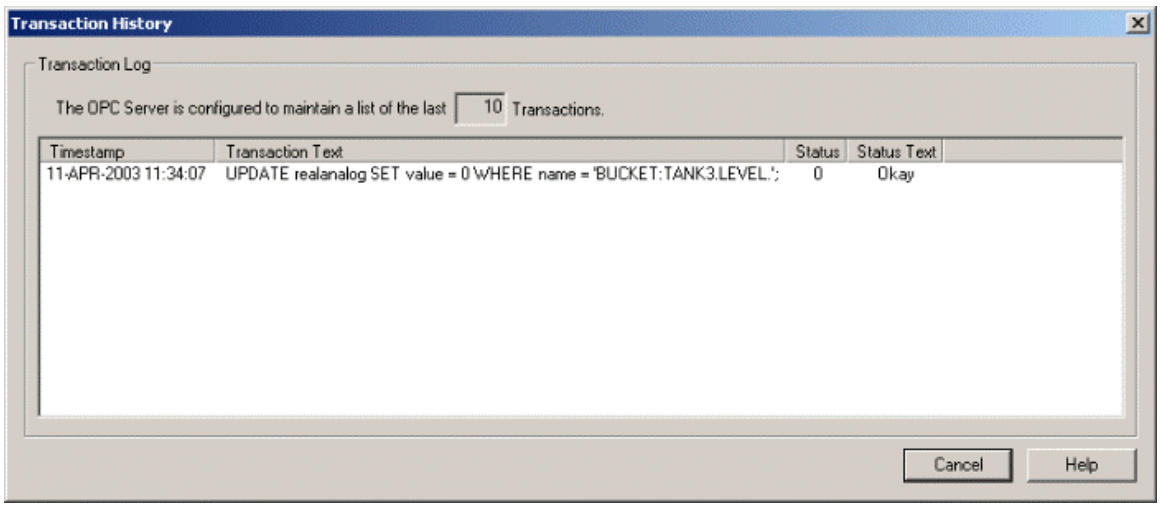
Selection of this button will close the dialog. If it is a dialog where configuration changes can be made, the changes will not be saved.

3.17.7 Context Sensitive Help

Selection of this button or menu option will open the OPC Server's help file at the appropriate topic.

3.18 Transaction History

This Dialog is accessed from the Transaction Log button of the Query and Transaction Diagnostics Dialog. It enables the user to determine the cause of any transaction failures.



3.18.1 Number of Transactions

The maximum number of transactions shown is determined by the value of the *TransactionLogLength* value.

This can be found in the Settings Editor under the *OpenEnterprise\Tasks\BristolOPCServer* key. If the value is undefined or is negative, then a default of the last 10 transactions will be shown. To change the default setting, if the value does not exist on the key, create it and set the data to the required value.

3.18.2 Transaction List

The list of the most recent database transactions.

3.18.3 Timestamp

The time of the transaction / query.

3.18.4 Transaction Text

The actual query sent to the database.

3.18.5 Transaction Status

The status of the transaction, as returned by the database.

3.18.6 Transaction Status Text

The status of the transaction given in textual form.

3.18.7 Cancel Button

Selection of this button will close the dialog. If it is a dialog where configuration changes can be made, the changes will not be saved.

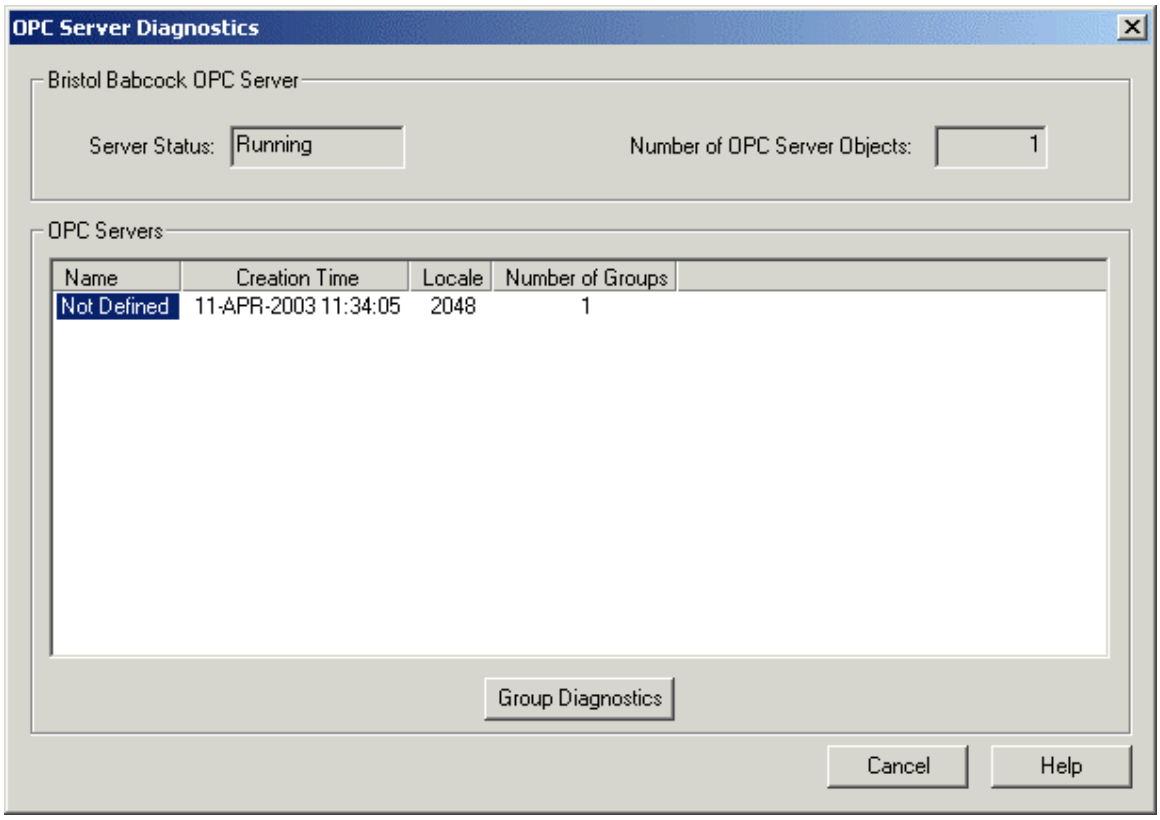
3.18.8 Context Sensitive Help

Selection of this button or menu option will open the OPC Server's help file at the appropriate topic.

4 OPC Diagnostics

4.1 Server

This form is accessed from the Diagnostics button in the OPC Section of the OPC Server's Main dialog. The OPC Server Diagnostics Dialog show the list of OPC Server objects being managed by the OPC Server, and any diagnostic information applicable to those objects.



4.1.1 OPC Server List

The list of OPC Server objects currently being managed by the OPC Server application.

4.1.2 OPC Server Status

The status of the OPC Server application.

4.1.3 Number of OPC Servers

The number of OPC Server objects currently being managed by the OPC Server application.

4.1.4 OPC Server Object Name

The name of the OPC Client that created the OPC Server object, (if supplied). A value of 'Not Defined' indicates that the OPC Client specified no name when adding the OPC Server object.

4.1.5 OPC Server Creation Time

The time the OPC Server object was created.

4.1.6 OPC Server Locale

The OPC Client's requested Locale. The default value of 2084 indicates that data should be retuned using the default system Locale. The formatting of numbers, dates, language or currency depend on the Locale.

Note: The Locale value is currently ignored by the Bristol OPC Server.

4.1.7 Number of OPC Groups

The number of OPC Groups created by the OPC Server object.

4.1.8 OPC Group Diagnostics Button

This button is enabled if an OPC Server object is selected from the OPC Server list. It enables the user to invoke the OPC Group Diagnostics dialog.

4.1.9 Cancel Button

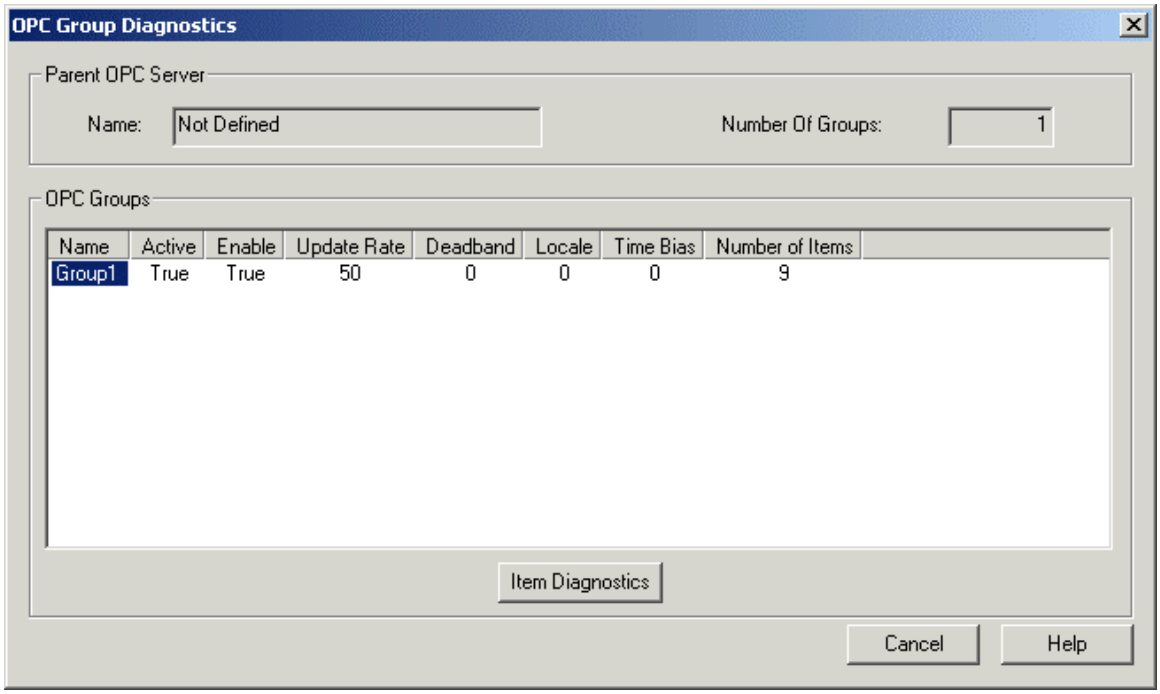
Selection of this button will close the dialog. If it is a dialog where configuration changes can be made, the changes will not be saved.

4.1.10 Context Sensitive Help

Selection of this button or menu option will open the OPC Server's help file at the appropriate topic.

4.2 Group

Displays the status and configuration of all OPC Group objects related to a specific OPC Client request for data (from an OPC Server object).



4.2.1 OPC Groups

The List of OPC Groups being managed by the OPC Server object.

4.2.2 Group Name

The OPC Group name, if available.

4.2.3 Group Active Status

States whether the OPC Group is currently active.

4.2.4 Group Enabled

The Enabled status of the OPC Group.

4.2.5 Group Update Rate

The rate requested by the OPC Client for updating of OPC Items within the OPC Group (shown in milliseconds).

4.2.6 Group Deadband

A percentage deadband that can be supplied to allow the Bristol OPC Server to optimize the reporting of any change in values of analog attributes defined within the OPC Group.

4.2.7 Group Locale

The Locale requested by the OPC Client for the Group. Note that the Group Locale is currently ignored by the Bristol OPC Server.

4.2.8 Group Time Bias

Gives an indication of the Time Zone in which the data was collected. Defaults to the Time Zone of the OPC Client.

4.2.9 Number of Items in Group

The number of OPC Items within the Group.

4.2.10 OPC Item Diagnostics Button

This button is enabled if an OPC Group object is selected from the OPC Group list. It enables the user to invoke the OPC Item Diagnostics dialog.

4.2.11 Cancel Button

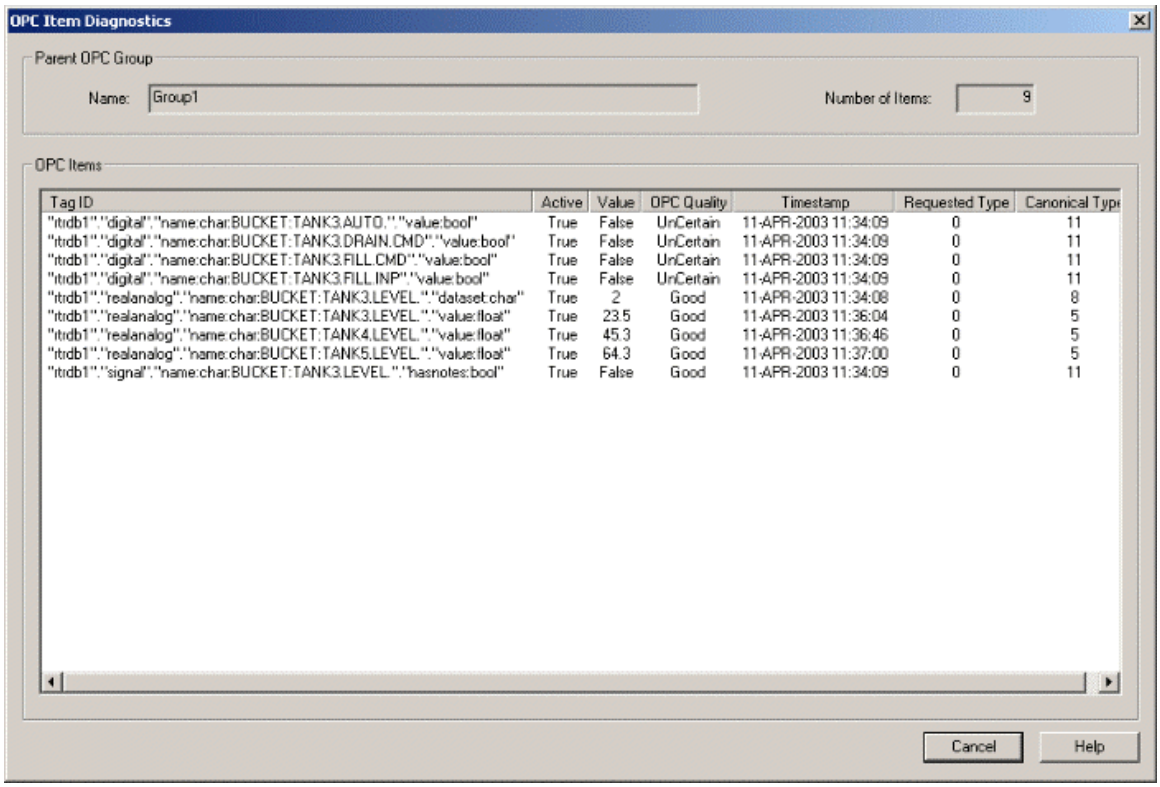
Selection of this button will close the dialog. If it is a dialog where configuration changes can be made, the changes will not be saved.

4.2.12 Context Sensitive Help

Selection of this button or menu option will open the OPC Server's help file at the appropriate topic.

4.3 Item

Displays the status and configuration of all OPC Item objects related to a specific OPC Group.



Tag ID	Active	Value	OPC Quality	Timestamp	Requested Type	Canonical Type
"ttrdb1"."digital"."name:char:BUCKET:TANK3.AUTO."."value:bool"	True	False	UnCertain	11-APR-2003 11:34:09	0	11
"ttrdb1"."digital"."name:char:BUCKET:TANK3.DRAIN.CMD"."value:bool"	True	False	UnCertain	11-APR-2003 11:34:09	0	11
"ttrdb1"."digital"."name:char:BUCKET:TANK3.FILL.CMD"."value:bool"	True	False	UnCertain	11-APR-2003 11:34:09	0	11
"ttrdb1"."digital"."name:char:BUCKET:TANK3.FILL.INP"."value:bool"	True	False	UnCertain	11-APR-2003 11:34:09	0	11
"ttrdb1"."realanalog"."name:char:BUCKET:TANK3.LEVEL."."dataset:char"	True	2	Good	11-APR-2003 11:34:08	0	8
"ttrdb1"."realanalog"."name:char:BUCKET:TANK3.LEVEL."."value:float"	True	23.5	Good	11-APR-2003 11:36:04	0	5
"ttrdb1"."realanalog"."name:char:BUCKET:TANK4.LEVEL."."value:float"	True	45.3	Good	11-APR-2003 11:36:46	0	5
"ttrdb1"."realanalog"."name:char:BUCKET:TANK5.LEVEL."."value:float"	True	64.3	Good	11-APR-2003 11:37:00	0	5
"ttrdb1"."signal"."name:char:BUCKET:TANK3.LEVEL."."hasnotes:bool"	True	False	Good	11-APR-2003 11:34:09	0	11

4.3.1 OPC Group Name

The OPC Group to which the displayed OPC Items belong.

4.3.2 OPC Item List

The list of OPC Items belonging to the selected Group.

4.3.3 Number of Items

The number of OPC Items within the OPC Group.

4.3.4 Tag Id

The OPC tag for the OPC Item. In the form of "<Database name>"."<Table Name>"."<Primary Key>"."<Attribute:Data Type>".

4.3.5 Tag Active

Indicates whether the Active flag for the OPC Item is set.

4.3.6 Tag Value

The value of the database attribute that the OPC Tag describes.

4.3.7 Tag OPC Quality

The OPC Quality of the retrieved data. This may be any of the permitted OPC Data Access quality values, with additional settings available for NW3000 signal attributes - see the NW3000 Signal Quality Attributes topic for more details.

4.3.8 Requested Type

The data type requested by the OPC Client for the OPC Item.

4.3.9 Canonical Type

This is the data type actually returned by the OPC Server for the OPC Item.

4.3.10 Cancel Button

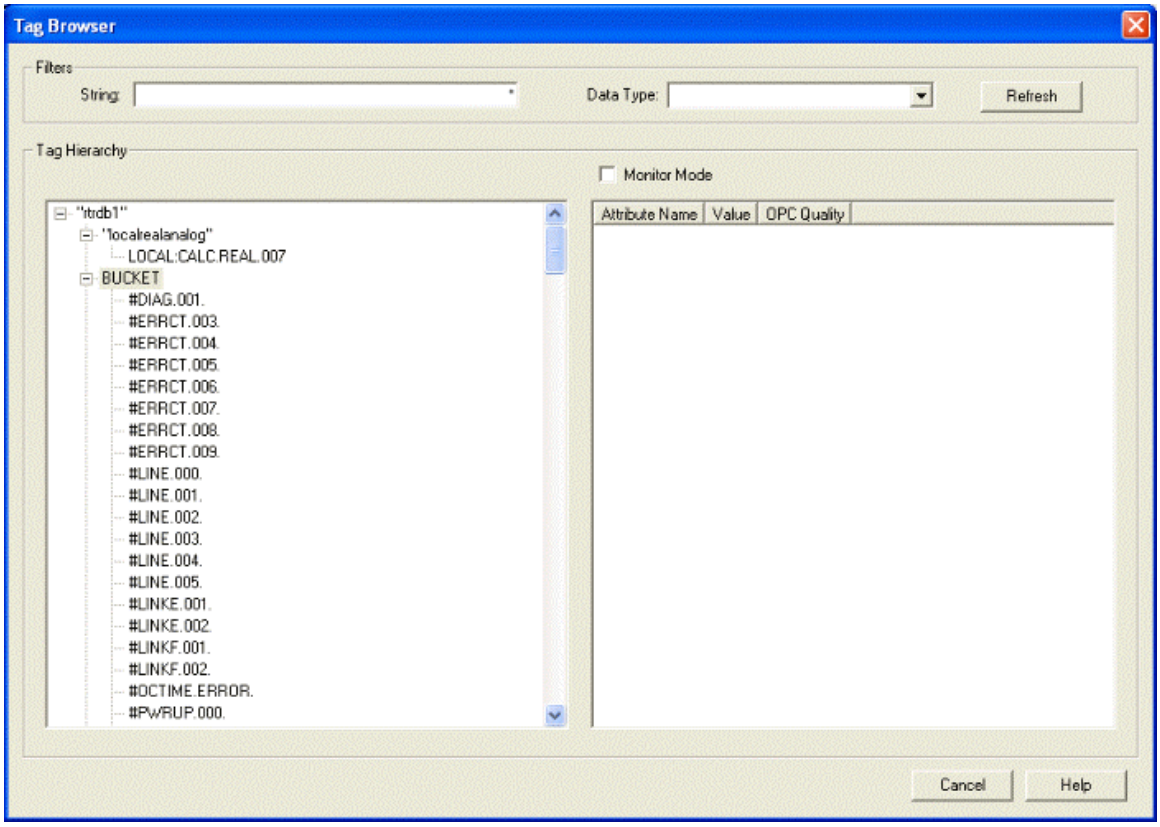
Selection of this button will close the dialog. If it is a dialog where configuration changes can be made, the changes will not be saved.

4.3.11 Context Sensitive Help

Selection of this button or menu option will open the OPC Server's help file at the appropriate topic.

5 OPC Tag Browser

This form is accessed from the Diagnostics button in the Tags Section of the OPC Server's Main dialog. The Tag Browser allows the user to navigate the hierarchy of tags known to the OPC Server, using both String and Data Type filters.



5.1 Filters

There are two types of filters that may be applied to the Tag Hierarchy Tree or the Tag Browser Attributes pane. They are String filters and Data Type Filters.

5.2 String Filter

Text Filters allow the user to restrict the number of records returned by the OPC Server when traversing the Tag Hierarchy.

The filters apply to the current level within the Tag Hierarchy, and therefore at the database level you might define a filter that restricts the number of databases shown. Similarly at the table level, you might choose only to view a particular table, or a range of tables.

Filtering functionality allows the use of wildcard characters, character lists, or character ranges, in any combination, to be defined as a text filter for comparison with the members of the current tag hierarchy level. The following table shows the characters that can be used within the text filter.

Character	Meaning
?	Matches any single character.
*	Matches zero or more characters.
#	Matches any single digit (0-9).
[character list]	Matches any single character contained within the character list.
[!character list]	Matches any single character not contained within the character list.

Separators are not required within the character list.

To match any of the special characters within a character list, i.e. ("[", "?", "#" and "*"), enclose them in brackets ("[" and "]"). The "]" can't be used within a character list to match itself, but it can be used outside of a character list as an individual character.

A hyphen "-" can be used to define a range of characters within the character list, (e.g. A-Z, would return any string containing the uppercase letters in the range A to Z).

5.3 Data Type Filter

The user can specify a data type, which can then be used to filter the available tags, based on whether the values of those tags could be returned in the requested format.

It is important to realise that this type of filter isn't used to filter tags whose native data type matches that requested, but instead is used to filter those tags whose value can be returned in the requested data type.

5.4 Refresh Button

Clicking this button will apply a newly configured filter to the Tag Browser.

5.5 Tag Hierarchy Tree

The Tag Hierarchy Tree can be used to traverse the tag hierarchy. It is populated on the fly, based on the current selection and any filters that may be defined.

The tree is split into three levels. At level one are the names of the databases for which tags exist. At the second level are the names of the tables and views. The third and final level shows the primary key values.

The labels associated with each level of the hierarchy tree is influenced by Settings Editor key values. For instance if the *ShowAlternativeTableName* data on the *OpenEnterprise\Tasks\BristolOPCServer* key is set to 1 then all Network3000 signals will be displayed under their node name, and not their table name. Similarly, the setting of the *AbbreviateTagLabels* key will dictate whether the full, or abbreviated primary key definition is displayed.

5.6 Monitor Mode Check

If checked, the current values of all tags known to the OPC Server, for the selected database object will be displayed in real-time.

5.7 Tag Browser Attributes List

Whenever a user selects an entry from the third level of the tag hierarchy, (i.e. the primary key level), the Attribute List control on the right hand side of the dialog will be populated with information on any attributes for which tags exist for that database object.

The attribute name, the value of the attribute and the OPC Quality for each tag will be displayed.

If Monitor Mode tick box is selected then any attributes being displayed in the Attribute List Control will be updated in real-time. This will allow the user to determine the values and OPC Quality of those attributes, without having to first request them through an OPC Client.

The *AbbreviateTagLabels* value on the *OpenEnterprise\Tasks\BristolOPCServer* key will determine whether the full, or abbreviated attribute name will be displayed.

5.8 Cancel Button

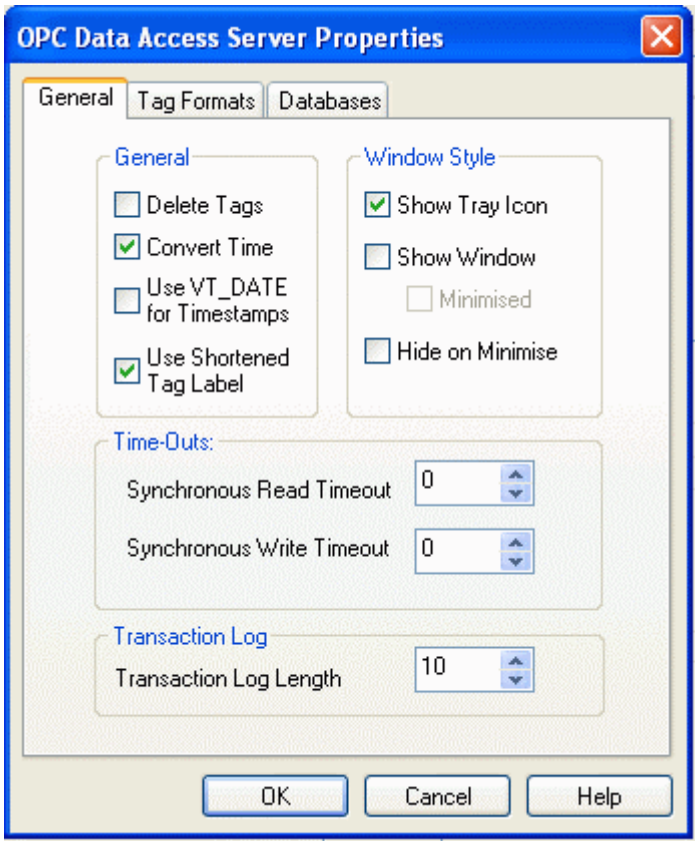
Selection of this button will close the dialog. If it is a dialog where configuration changes can be made, the changes will not be saved.

5.9 Context Sensitive Help

Selection of this button or menu option will open the OPC Server's help file at the appropriate topic.

6 Properties - General Tab

The General Tab of the Property pages is accessed from the Edit menu of the OPC Server's Main dialog. It enables the user to change many of the OPCServer's settings.



6.1 Delete Tags

Causes the OPC Server to delete tags from the browse structures when the OPC Client removes those tags.

6.2 Convert Time

Determines whether the OPC Server converts all timestamps to local time prior to sending them to the OPC Client.

6.3 Use VT_DATE for Timestamps

If the check box is UNticked then date and time data will ALWAYS be returned to the OPC Client as a string in the format DD-MMM-YYYY HH:MM:SS.mmm e.g.

29-JAN-2003 10:05:01.285

If the check box IS ticked, then the date and time data is returned in VT_DATE form, and the precise formatting, and how that data is presented to the user is the responsibility of the OPC Client. For instance an OPC Client may display such data in the format DD/MM/YYYY HH:MM:SS e.g.

29/01/2003 10:05:01

Other OPC Clients may provide a different format, or allow the user a range of formats in which to present such data.

6.4 Use Shortened Tag Label

Checking this box sets the *AbbreviateTagLabels* value on the *OpenEnterprise\Tasks\BristolOPCServer* key to a non-zero value (1). This causes the labels displayed at the primary key and attribute levels of the browse hierarchy to be abbreviated.

6.4.1.1.1.1 Normal Tag Labels

1. The Primary Key is displayed along with the primary key name and data type. **(Click to view)**

```
"name:char:TANKS:TANK3.LEVEL."
"name:char:TANKS:TANK3.LO."
"name:char:TANKS:TANK3.LOLO."
"name:char:TANKS:TANK3.MAX."
"name:char:TANKS:TANK3.MIN."
"name:char:TANKS:TANK3.STEP.DOWN"
"name:char:TANKS:TANK3.STEP.UP"
"name:char:TANKS:TANK4.AUTO."
"name:char:TANKS:TANK4.DRAIN.CMD"
"name:char:TANKS:TANK4.FILL.CMD"
"name:char:TANKS:TANK4.FILL.INP"
"name:char:TANKS:TANK4.LEVEL."
"name:char:TANKS:TANK4.MAX."
"name:char:TANKS:TANK4.MIN."
```

2. Attribute names are displayed along with the datatype, **(Click to View)**

"acknowledged:bool"	False	UnCertain
"alarminhibit:bool"	False	UnCertain
"controlinhibit:bool"	False	UnCertain
"description:char"		UnCertain
"highacknowledged:bool"	False	UnCertain
"highhighacknowledged:bool"	False	UnCertain
"inalarm:bool"	False	UnCertain
"inhighalarm:bool"	False	Good
"inhighhighalarm:bool"	False	UnCertain
"inlowalarm:bool"	False	UnCertain
"inlowlowalarm:bool"	False	UnCertain
"lowacknowledged:bool"	False	UnCertain
"lowlowacknowledged:bool"	False	UnCertain
"manualinhibit:bool"	False	UnCertain
"name:char"	TANKS:TANK3.LEVEL.	Good
"questionable:integer"	0	Good
"units:char"		UnCertain
"value:float"	15	Good

6.4.1.1.1.2 Shortened Tag Labels

1. The Primary Key displays the value of the PK only, **(Click to view)**

- TANK3.LEVEL.
- TANK3.LO.
- TANK3.MAX.
- TANK3.MIN.
- TANK3.STEP.DOWN
- TANK3.STEP.UP
- TANK4.HI.
- TANK4.LEVEL.
- TANK4.STEP.DOWN
- TANK4.STEP.UP

2. Attributes are displayed without the data type. **(Click to view)**

acknowledged	False	UnCertain
alarminhibit	False	UnCertain
controlinhibit	False	UnCertain
description		UnCertain
highacknowledged	False	UnCertain
highhighacknowledged	False	UnCertain
highlimit	0	UnCertain
inalarm	4.94065645841247E-324	Good
inalarm	4.94065645841247E-324	Good
inhighalarm	False	Good
inhighhighalarm	False	UnCertain
inlowalarm	False	UnCertain
inlowlowalarm	False	UnCertain
lowacknowledged	False	UnCertain
lowlimit	0	UnCertain
lowlowacknowledged	False	UnCertain
manualinhibit	False	UnCertain
name	TANKS:TANK3.LEVEL.	Good
questionable	0	Good
units		UnCertain
value	81	Good

6.5 Show Tray Icon

Indicates whether an icon is inserted into the system tray when the OPC Server is running.

6.6 Show Window

Used to indicate if the OPC Server is created visible or hidden.

6.7 Minimized

Used in conjunction with the ShowWindow setting to indicate whether the window is created minimised or normalised.

6.8 Hide on Minimize

Used to indicate that the window should be hidden rather than minimised if the user attempts to minimise the OPC Server.

6.9 Synchronous Read Timeout

Indicates the timeout, in milliseconds, after which synchronous reads will be aborted

6.10 Synchronous Write Timeout

Indicates the timeout, in milliseconds, after which synchronous writes will be aborted

6.11 Transaction Log Length

The number of transactions shown in the Transaction List of the Transaction History Dialog is determined by the data of the *TransactionLogLength* value on the *OpenEnterprise\Tasks\BristolOPCServer* key. If this is undefined or is negative, then a default of the last 10 transactions will be shown. This value can be changed here.

6.12 OK Button

When selected, any configuration changes made will be saved and the dialog will close. The OPC Server must be restarted for the changes to take effect.

6.13 Cancel Button

Selection of this button will close the dialog. If it is a dialog where configuration changes can be made, the changes will not be saved.

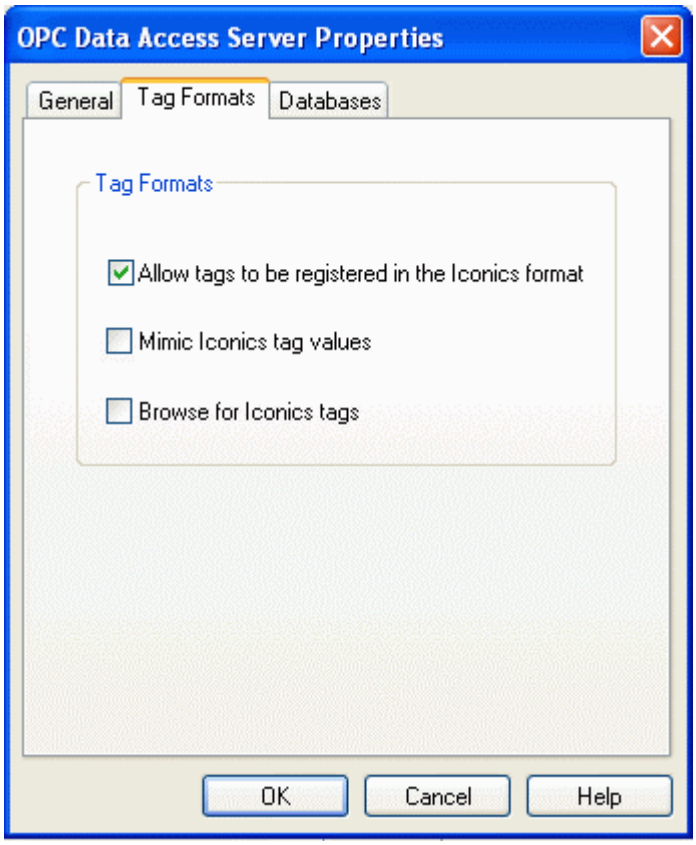
6.14 Context Sensitive Help

Selection of this button or menu option will open the OPC Server's help file at the appropriate topic.

7 Properties - Tag Formats Tab

This tab enables the user to configure the OpenEnterprise OPC Server so that it reads and writes tags in the same format as the OpenBSI OPC Server, originally developed for RAS\Bristol devices by Iconics™. For more information on the differences in tag format between these OPC Servers, see the "Differences between OPC Tag Formats" section.

It is possible to automatically enable the OpenEnterprise OPC Server to register tags which have the Bristol BSI OPC Server Program ID without having to change any part of the tags physically by running the "IconicsOPCServerReplace.cmd" command file. The "Allow tags to be registered in the Iconics format" option on this tab is enabled by default. For further information see the 'Browsing Iconics OPC Tags' section in the 'Allow tags to be registered in Iconics Format' topic.



7.1 Differences between OPC Tag Formats

Although OPC is a standardized protocol, the actual tag format used by OPC Servers can be different.

Before OpenEnterprise was born, Iconics produced an OPC Server application that served data from RAS\Bristol devices to their OPC client application, GraphWorX™.

When OpenEnterprise came along, it had its own OPC Server that could serve tags from the OpenEnterprise datastore to GraphWorX™ displays. This could cause a problem for users upgrading to OpenEnterprise in that the tag format used by these OPC Servers is different. Many displays may have already been created.

However, OpenEnterprise has provided a means of adapting GraphWorX™ displays created using the Iconics OPC Server without the necessity for time consuming modifications. OpenEnterprise can be configured to interpret Iconics tags as OpenEnterprisetags, using the options on the Tag Formats Tab Property page of the OpenEnterprise OPC Server.

7.1.1 More About OPC

OPC (OLE For Process Control) is a program connectivity standard based on an earlier technology called OLE (Object Linking and Embedding).

OLE is a compound document technology developed by Microsoft™ for embedding chunks of data from one program to another, so for example part of an Excel™ spreadsheet could be embedded into a Word™ document.

The OLE concept introduced the idea of a Client application, which was the container object (the Word document in our example), which requested the embedded data from a Server application (the program which produced the embedded data - i.e. Excel in our example).

OLE was extended into the world of Process Control, and the OPC standard (OLE For Process Control) was developed. OPC allows OPC Client applications to obtain data from Remote Telemetry Units (RTUs) and Programmable Logic Controllers (PLCs) via an OPC Server.

OPC Servers utilize OPC protocols to 'serve' data to OPC Client applications from a data store that is created by native Remote Device Interface (RDI) applications. The RDIs obtain data directly from RTU and PLC devices and place it into a local data store. The OPC Server is then able to connect to the data store and 'serve' this data to OPC Clients, such as a GraphWorX display.

The data requested by OPC Clients is in the form of 'tags'. Each tag is a coded string that defines a discreet value from the data store that is accessed by the OPC Server. The tag incorporates the OPC Server's unique program id and the necessary information that maps the discreet value to a particular field in the data store.

7.1.2 Tag Definitions

The tag definitions below highlights the common elements of an OpenEnterprise and an Iconics tag by using bold styling. The only common element between the tag formats is the **[device.signal]** element.

7.1.2.1 Iconics Tag Definition

`[ProgramID]\`**`[device:signal]`**`_[attribute]`

7.1.2.1.1 Example

The following example tag represents an analogue signal value in Iconics format:-

`BristolBabcock.OpenBSIOPCServer.1\`**`NORTH:SINE.VALUE.001`**`_Value`

7.1.2.2 Bristol OPC Server Tag Definition

`[ProgramID]\[dataservice].[table].`**`[device:signal]`**`.[attribute]`

7.1.2.2.1 Example

The following example tag represents an analogue signal value in Bristol OPC Server format:-

`BristolBabcock.BristolOPCServer\"rtrdb1"."nw3000realanalog"."name:varchar:`**`NORTH:SINE.VALUE.001`**`"."value:float"`

7.1.3 Tag Differences

The Bristol OPC Server and Iconics tags differ in that:-

- The OPC Server program ID differs.
- The OPC tag format differs.
- The definition of several comparable tags is different e.g. alarm acknowledge tags.
- Not all the Iconics tags are available through the Bristol OPC Server . E.g. Comms

The tag name format used by the Iconics OPC Server is different from that used by the Bristol OPC Server . The Bristol OPC Server can be configured to support the Iconics format. This allows OPC clients to perform the following actions with the Bristol OPC Server:

- Register tags that are in the Iconics tag format.
- Return certain values in a format that is normally expected by users of the Iconics OPC Server

- Browse for tags with the Bristol OPC Server that will be returned in the Iconics tag format.

7.1.4 Tag Conversion

The following table details how the Iconics 'attribute' portion of the tag is converted to an OpenEnterprise database attribute.

Iconics attribute	Signal type	OpenEnterprise attribute	Notes
Name	*	Name	Signal name
Value	*	Value	
Quest	*	Questionable	
AI	*	AlarmInhibit	
MI	*	ManualInhibit	
CI	*	ControlInhibit	
Desc	*	Description	
Units	A, AA	Units	
LogTxt	L, LA	CurrentState	
Comm	*	Status	
Alarm	AA, LA	InAlarm	TRUE when in-alarm
HIAlm	AA	InHighAlarm	TRUE when in high alarm
HIAck	AA	**NOT** HighAcknowledged	For Iconics this is the unacknowledged state of the alarm condition. For OpenEnterprise this is the acknowledged state.
HHAlm	AA	InHighHighAlarm	TRUE when in high-high alarm
HHAck	AA	**NOT** HighHighAcknowledged	For Iconics this is the unacknowledged state of the alarm condition. For OpenEnterprise this is the acknowledged state.
LOAlm	AA	InLowAlarm	TRUE when in low alarm
LOAck	AA	**NOT** LowAcknowledged	For Iconics this is the unacknowledged state of the alarm condition. For OpenEnterprise this is the acknowledged state.
LLAlm	AA	InLowLowAlarm	TRUE when in low-low alarm
LLAck	AA	**NOT** LowLowAcknowledged	For Iconics this is the unacknowledged state of the alarm condition. For OpenEnterprise this is the acknowledged state.
NOAck	AA, LA	**NOT** Acknowledged	For Iconics this is the unacknowledged state of the signal. It will be TRUE if any of the alarm conditions is currently unacknowledged. For OpenEnterprise, this value always reflects the alarmsummary acknowledged state and not the underlying signals acknowledged state.

7.1.4.1 Note on Acknowledged attribute

The value of the Acknowledged attribute within OpenEnterprise is maintained from a combination of BSAP remote alarm reports, user acknowledgement through OpenEnterprise and OpenEnterprise configuration. The net result is the acknowledged bit within the RTU may differ from that within OpenEnterprise.

The OpenEnterprise acknowledged tag will be FALSE (not acknowledged) following the receipt of a BSAP remote alarm report for a signal that has gone into alarm. By default, a return-to-normal remote alarm report will not set the acknowledged tag to FALSE. However, the requirement to acknowledge a return-to-normal remote alarm report can be enabled.

The OpenEnterprise acknowledged tag will be TRUE (acknowledged) following a user acknowledgment i.e. manually setting the OPC tag to TRUE.

The Not Acknowledged bit within the RTU will be set following any into-alarm or return-to-normal state change for the signal.

The following scenarios may result in the OpenEnterprise Acknowledged value showing a different state from the RTU:

- Following the receipt of a return-to-normal alarm report for an alarm that has been acknowledged within OpenEnterprise.
- If an in-alarm signal is acknowledged in the RTU via a means other than OpenEnterprise e.g. DataViews.

In order to support the conversion of Iconics tags, the configuration setting EnableIconicsTagNameConversion must be enabled. When enabled, the standard OpenEnterprise tag format will also be supported concurrently i.e. it will be possible for a client to register tags in the Iconics and the OpenEnterprise format.

7.1.5 Tag Value Consistency

The actual value returned for corresponding Iconics and ObjectServer tags is not always consistent. When Iconics tag conversion is enabled, item values for Iconics tags will be returned to the Client having been automatically converted to the Iconics format.

This means that on a system which has both Iconics and ObjectServer tags registered concurrently, the return values for some tag values may differ e.g. the acknowledged bits.

The following table details the discrepancies and the required value conversion logic.

Iconics attribute	Signal type	Value conversion rule
Name	*	ObjectServer returns a full unambiguous device specific signal name whilst Iconics returns just the name portion. The device name portion of the name will be removed from the returned signal name. Any characters up to and including the first ':' character will be removed. E.g. "NORTH:TANK3.LEVEL." is returned as "TANK3.LEVEL."
Value	*	Raw
Quest	*	The Iconics native data type is BOOL. The ObjectServer native data type is LONG. A non-zero ObjectServer value will be returned as TRUE (1, questionable). A value of zero will be returned as FALSE (0, not questionable).
AI	*	Raw
MI	*	Raw

CI	*	Raw
Desc	*	Raw
Units	A, AA	Raw
LogTxt	L, LA	Raw
Comm	*	The Iconics Help would indicate that a Comm value of TRUE (On) would indicate a communication error. Errors such as a timeout of RTU offline will result in a negative Status value in ObjectServer. The Comm value is a BOOL and will be linked to the ObjectServer integer **status** attribute. A **status** value greater than or equal to zero will return FALSE (0) and a value less than zero will return TRUE (1).
Alarm	AA, LA	Raw
HIAlm	AA	Raw
HIAck	AA	**NOT** HighAcknowledged
HHAlm	AA	Raw
HHAck	AA	**NOT** HighHighAcknowledged
LOAlm	AA	Raw
LOAck	AA	**NOT** LowAcknowledged
LLAlm	AA	Raw
LLAck	AA	**NOT** LowLowAcknowledged
NOAck	AA, LA	**NOT** Acknowledged

7.2 Allow Tags to be registered in Iconics Format

☑ Allow tags to be registered in the Iconics format

This box is ticked by default allowing the OpenEnterprise OPC Server to register tags in Iconics tag format once certain registry settings have been set using the "IconicsOPCSeverReplace.cmd file.

The value represented by this check box is stored in the OpenEnterprise.ini configuration file under the *Tasks\BristolOPCServer* key in the *EnableIconicsTagConversion* setting. The OpenEnterprise.ini file can be viewed using the SettingsEditor, but we strongly advise against making configuration changes using the Settings Editor. All settings should be configured using the component interface, in this case, the OpenEnterprise OPC Server.

7.3 Mimic Iconics Values

☐ Mimic Iconics tag values

By default this box will be unchecked. If ticked, converted Iconics tags will have their values converted to the value expected by an Iconics OPC Server user. Note that this only applies to certain tags - see the Tag Conversion topic for more information.

This value represented by this check box is stored in the OpenEnterprise.ini configuration file under the *Tasks\BristolOPCServer* key in the *DisableIconicsTagValueConversion* setting. The OpenEnterprise.ini file can be viewed using the SettingsEditor, but we strongly advise against making configuration changes using the Settings Editor. All settings should be configured using the component interface, in this case, the OpenEnterprise OPC Server.

7.4 Browse for Iconics Tags

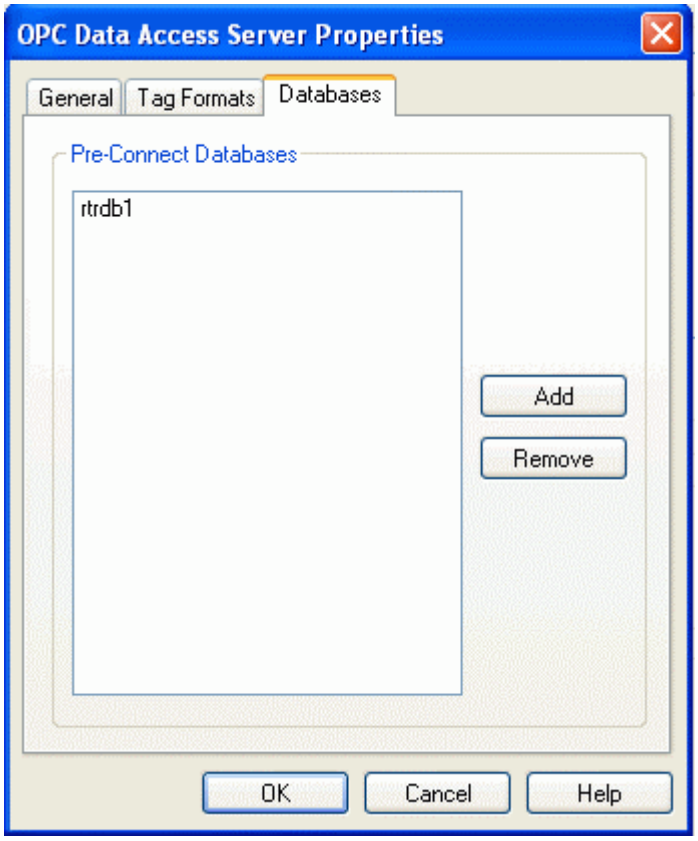
☐ Browse for Iconics tags

If this box is ticked, the OpenEnterprise OPC Server tag browser interface returns tags in the Iconics OPC Server format. By default, the value will be FALSE and all tags will be returned in OpenEnterprise OPC Server format.

The value represented by this check box is stored in the OpenEnterprise.ini configuration file under the *Tasks\BristolOPCServer* key in the *BrowseIconicsTagFormat* setting. The OpenEnterprise.ini file can be viewed using the SettingsEditor, but we strongly advise against making configuration changes using the Settings Editor. All settings should be configured using the component interface, in this case, the OpenEnterprise OPC Server.

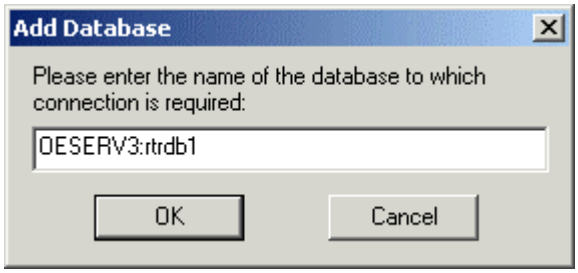
8 Properties - Databases Tab

The Property Tab enables the user to add and remove connectable databases.



8.1 Add Dialog

This Dialog enables the user to specify a new database which the OPCServer will attempt to connect to on start up.



8.2 Remove Button

Any selected database from the Pre-Connect Databases List will be removed.

8.3 Pre Connect Databases List

The list of databases to which the OPC Server will automatically connect on start up.

8.4 OK Button

When selected, any configuration changes made will be saved and the dialog will close. The OPC Server must be restarted for the changes to take effect.

8.5 Cancel Button

Selection of this button will close the dialog. If it is a dialog where configuration changes can be made, the changes will not be saved.

8.6 Context Sensitive Help

Selection of this button or menu option will open the OPC Server's help file at the appropriate topic.

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