



E!QT

Version 6.0.2

Infoplus.21 Add-in for Excel

User's Manual & Installation Manual

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Ellipsys E!QT User's Manual for version 6.0.1

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Table of Contents

1	E!QT Release Notes	5
1.1	About the Release Notes	5
1.2	General Information	5
1.3	Software Enhancements in 6.0.1	5
1.4	Software Enhancements in 6.0	6
1.5	Software Enhancements in 5.5	6
1.6	Software Fixes in 5.5	6
1.7	Software Enhancements in 5.2	6
1.8	Software Fixes in 5.2	6
2	E!QT Installation and Configuration	7
2.1	Prior to Installation	7
2.2	Installation	7
2.3	Configuration	13
3	Using the E!QT	16
4	E!AddIn Functions	17
4.1	Data Retrieval Functions	17
4.2	IP21Def - Single Tag Definition Function	18
4.3	IP21RecFld - Single Record and Field Retrieval Function	19
4.4	IP21Agg – Single Tag Aggregate Function	20
4.5	IP21Get - Multiple Tag History Retrieval Function	22
4.6	IP21Name - Tag Search Function	25
4.7	Time Functions	26
4.8	Interval Functions	28
4.9	Fixed Area Masks	29

4.10	History Area Masks	30
4.11	Miscellaneous	31
5	Advanced Troubleshooting	32

1 E!QT Release Notes

1.1 About the Release Notes

E!QT version 6.0.1 is the latest version of the Ellipsys Add-in for InfoPlus.21/Setcim. This document contains:

- General Information
- Software fixes that have been included in E!QT version 5.2 and 5.5.

1.2 General Information

- E!QT version 6.0.1 is supported on Windows 2000 or Windows NT using Excel 97, Excel 2000, Excel XP, Excel 2003.
- E!QT has been tested with InfoPlus.21 2.5 and above however, some differences in behavior may be observed as the API for these different version has changed. Ellipsys recommends using InfoPlus.21 4.1 and above.
- E!QT has been tested with SETCIM 4.8 and 4.9. The availability of Aggregate data is only available with SETCIM 4.9 and above.
- User should refer to the most current version of the installation manual or installation instructions when installing or upgrading software.

EQT Functionality Matrix	EQT		
	Setcim 4.8	Setcim 4.9+	IP.21 3.1 – 5.0
Features			
Aggregates (Historical Statistical Data)	No	Yes	Yes
Actual Data (Historical Values)	Yes	Yes	Yes
Actual Data Interpolation	No	No	Yes
Actual Data Best Fit	No	No	Yes
Supports IPX Record Structures	Yes	Yes	Yes
Support Any Mapped History Repeat Area	Yes	Yes	Yes
Tag Browser	Yes	Yes	Yes
Multiple Hosts	Yes	Yes	Yes
Host Configuration Wizard	Yes	Yes	Yes

1.3 Software Enhancements in 6.0.2

- Enhanced selector record compatibility.

1.4 Software Enhancements in 6.0.1

- Execution time reduction.

1.5 Software Enhancements in 6.0

- Infoplus.21 6.0 compatibility enhancements

1.6 Software Enhancements in 5.5

- Added Functions and Functionality to existing functions as well as Unified look and feel of the GUI for each function.
 - IP21Agg – New function to return an aggregate value of a single record (tag) for a given period of time.
 - IP21Def – New function to return the definition record for any tag in the IP.21 database.
 - IP21Get – Enhanced function inputs. This function returns fixed area information as well as historical (aggregate or actual) data from one or more records (tags) in the database
 - IP21Name – Now a function (rather than a macro) to return a list of record that match name, description or case search criteria.
 - IP21RecFld – Enhanced function to accept occurrence numbers. This function returns the value of any record and field in the IP.21 database.

1.7 Software Fixes in 5.5

- Fixed numerous parsing issues for EQT formulae when repopulating their respective forms.
- Each function now allows specification of Host.

1.8 Software Enhancements in 5.2

- Enhanced IP21Name Tag Search GUI to place all definition records in the **Search Record Type** combo box.
- Enhanced **IP21RecFld** function GUI to place all possible fields in record in the **Field Name** combo box.
- **IP21Get** enhanced to accept split ranges or named ranges as input for Tags and Maps.
- **IP21Get** enhanced to return delta times in 10ths of seconds from start time.

1.9 Software Fixes in 5.2

Affecting IP21Get

- If selector record definition had an odd number of characters, undetermined data would be returned. (i.e. ON/OFF)
- If history for text record definitions had an odd number of characters, undetermined data would be returned.
- If actual history data was requested from discrete records formatted by selectors and the selector was not checked, undetermined data would be returned.
- If only fixed area items were selected on the IP21Get form, it didn't properly handle the Transpose option. If the HIS_TRANSPOSE was entered into the formula manually, the function worked correctly.

2 E!QT Installation and Configuration

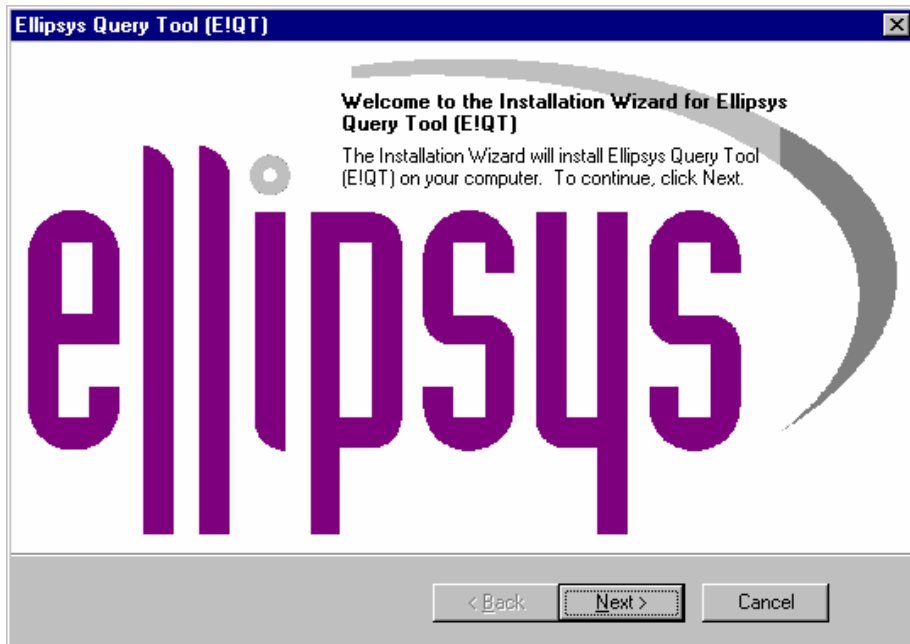
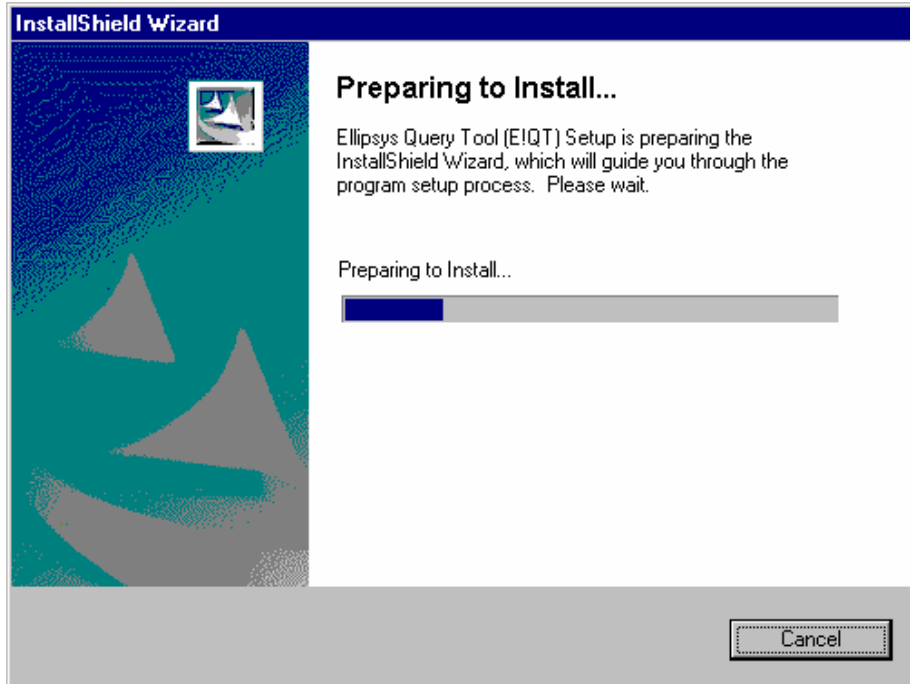
2.1 Prior to Installation

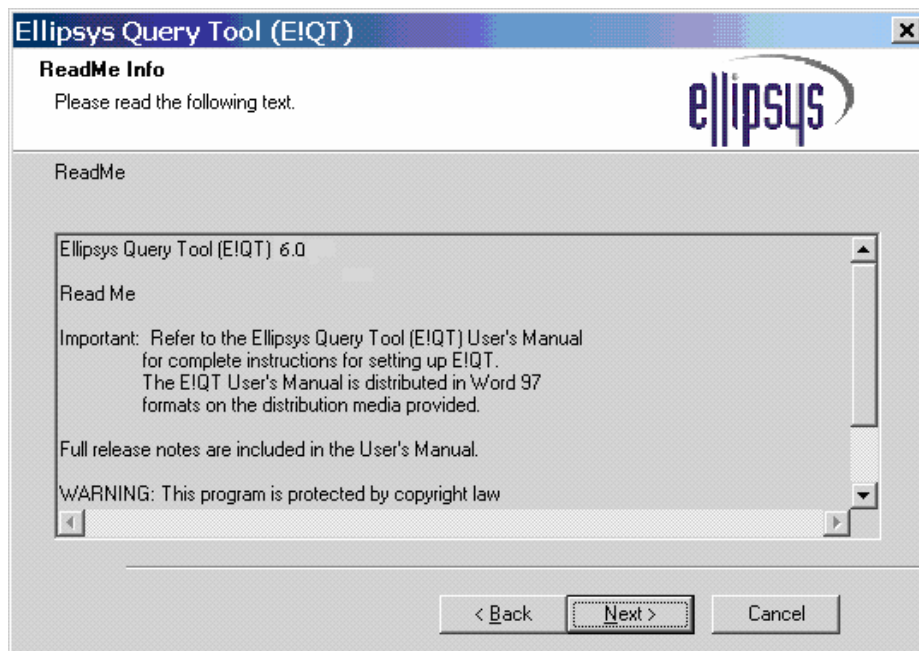
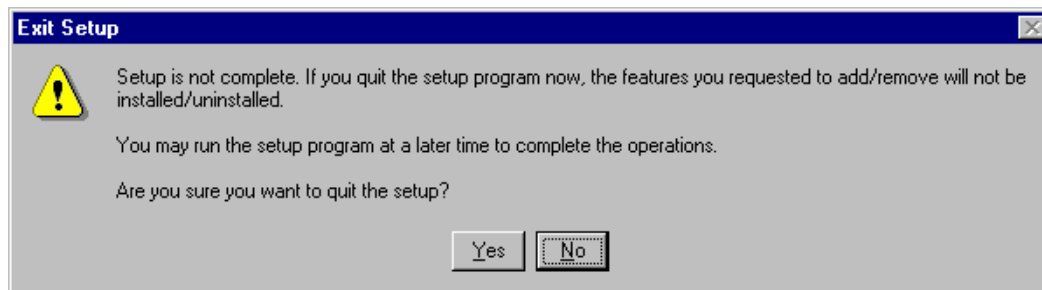
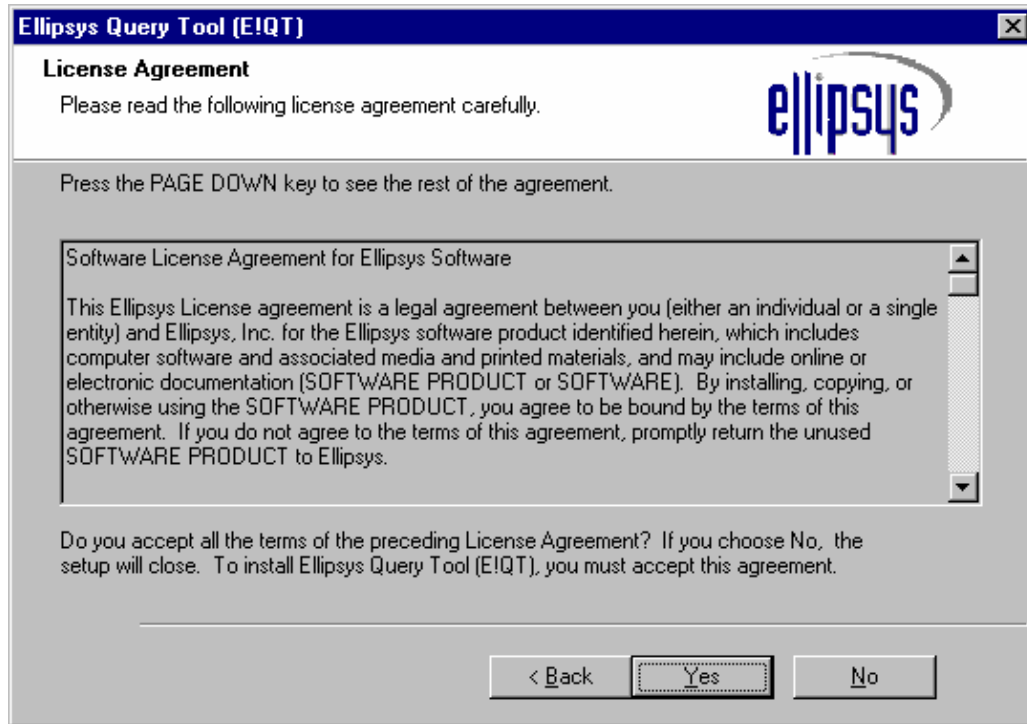
Excel 97, 2000, XP, 2003 should be installed such that it allows MACROs to run (i.e. either with low or medium security). Additionally, Excel should be installed and configured so that no dialog boxes pop-up during startup or shutdown of Excel, since these may cause the E!QT installation to fail.

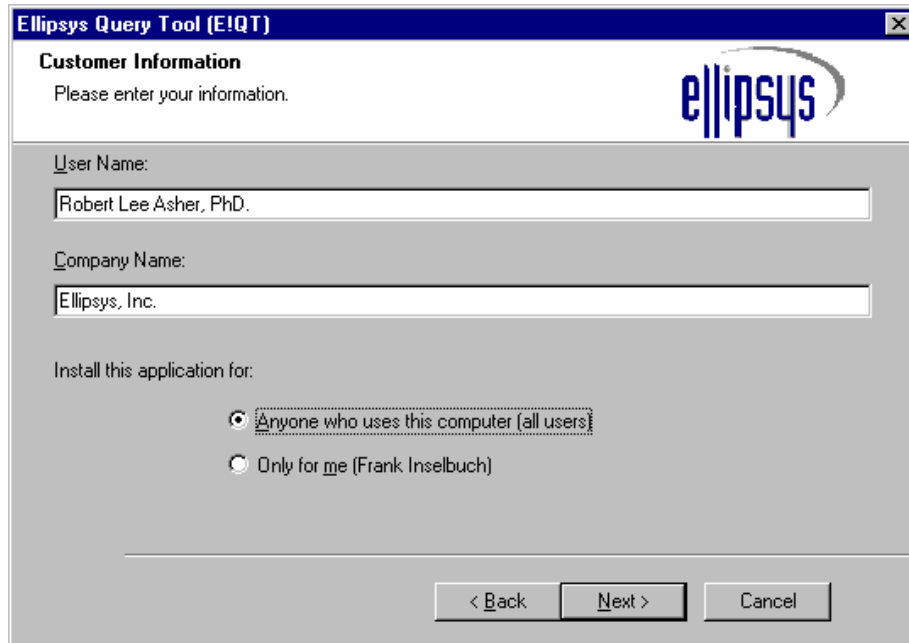
2.2 Installation

2.2.1 Standard Installation

This documents describes the process for installing the E!QT (Ellipsys Query Tool) application for Excel. The E!QT uses Excel 97, 2000, XP, and 2003 running on Window NT/2000. The install is run using the SETUP.EXE supplied on the CD. The install requires administrative privileges on the install machine and the InfoPlus.21 server. Once the SETUP.EXE has started the user will see and complete the following screens:







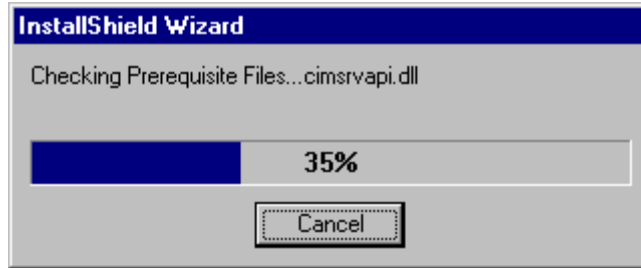
The screenshot shows a window titled "Ellipsys Query Tool (EIQT)". The main heading is "Customer Information" with the instruction "Please enter your information." and the Ellipsys logo. There are two text input fields: "User Name:" containing "Robert Lee Asher, PhD." and "Company Name:" containing "Ellipsys, Inc.". Below these is a section "Install this application for:" with two radio button options: "Anyone who uses this computer [all users]" (which is selected) and "Only for me (Frank Inselbuch)". At the bottom are three buttons: "< Back", "Next >", and "Cancel".

On this screen the user should enter their name and the company name.



The screenshot shows a window titled "Ellipsys Query Tool (EIQT)". The main heading is "Choose Destination Location" with the instruction "Select folder where Setup will install files." and the Ellipsys logo. The text reads: "Setup will install Ellipsys Query Tool (EIQT) in the following folder. To install to this folder, click Next. To install to a different folder, click Browse and select another folder." Below this is a text box labeled "Destination Folder" containing "C:\Program Files\Ellipsys\EQT\" and a "Browse..." button. At the bottom are three buttons: "< Back", "Next >", and "Cancel".

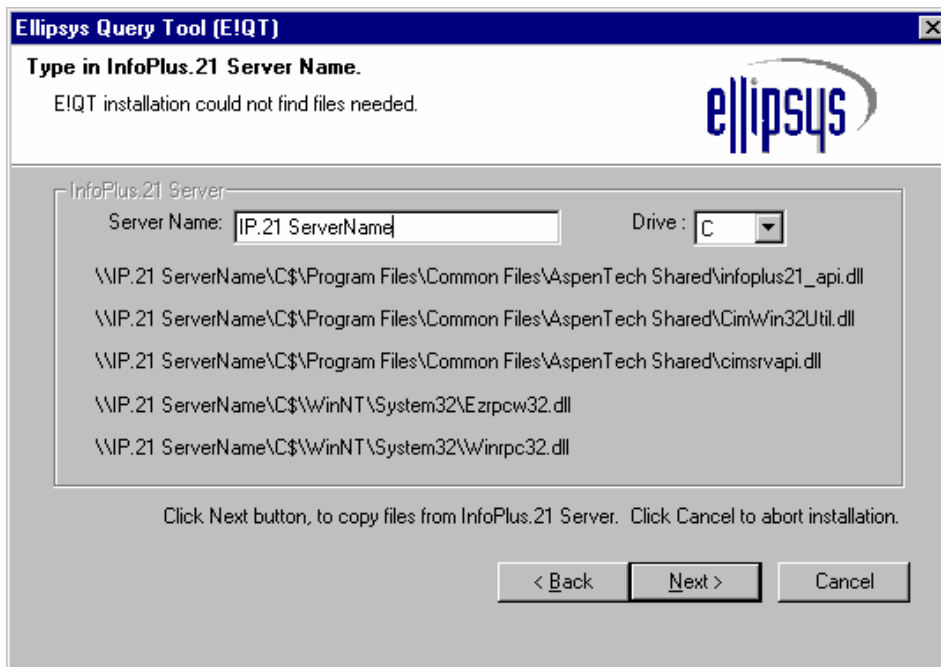
On this screen the user can modify the location of the installed files or accept the default.



The E!QT install procedure will copy prerequisite files from the InfoPlus.21 server. The user needs to have read privileges for the following files on the server.

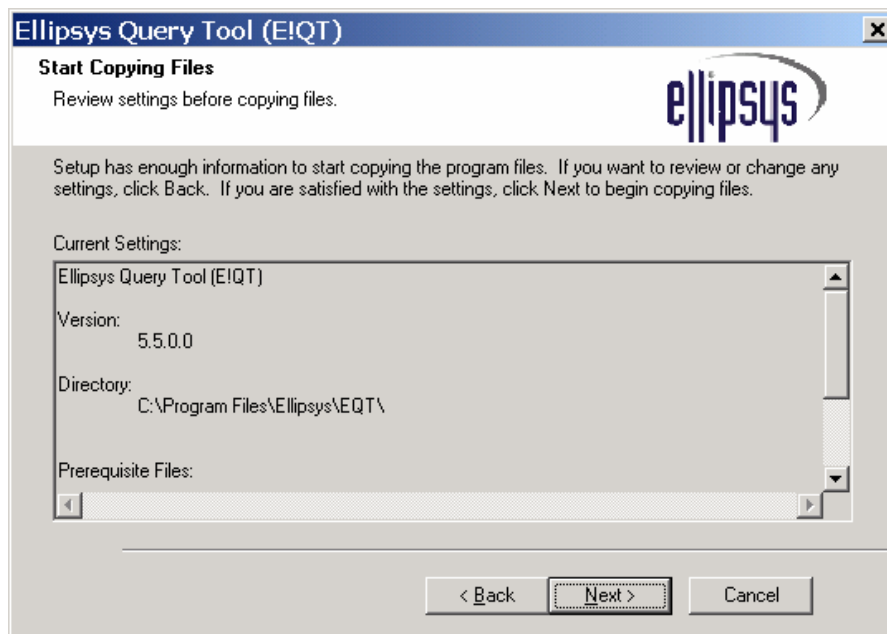
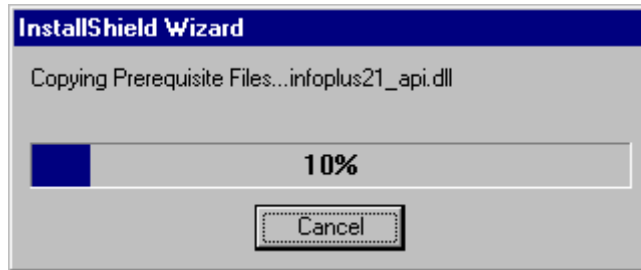
- o Y:\WinNT\System32\Ezrpcw32.dll
- o Y:\WinNT\System32\Winrpc32.dll
- o X:\Program Files\Common Files\AspenTech Shared\cimsrvapi.dll
- o X:\Program Files\Common Files\AspenTech Shared\CimWin32Util.dll
- o X:\Program Files\Common Files\AspenTech Shared\Infoplus21_api.dll
- o X:\Program Files\Common Files\AspenTech Shared\ip21admin_client.dll *

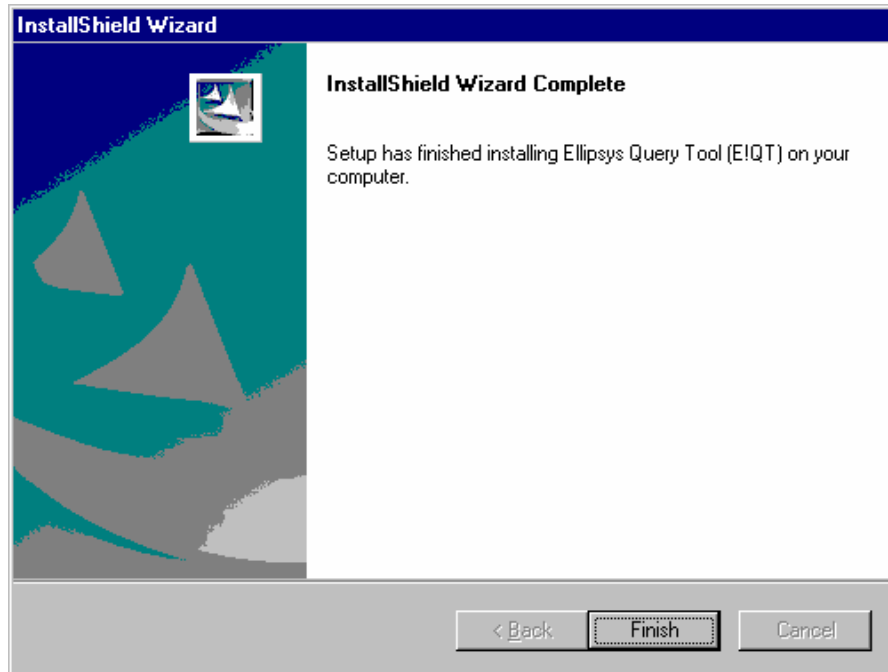
* Required when files copied from an AMS 5.0 server and above.



If prerequisite files exist on your computer, installation will skip this window. On this screen the user can tell installation program IP.21 server name to get prerequisite files. These files allow the RPC

connections to the IP.21 Database. The server name should be obtained from the system administrator.





A reboot will be required for machines which don't have MSI installed. Other conditions may also require a reboot, but these have been minimized.

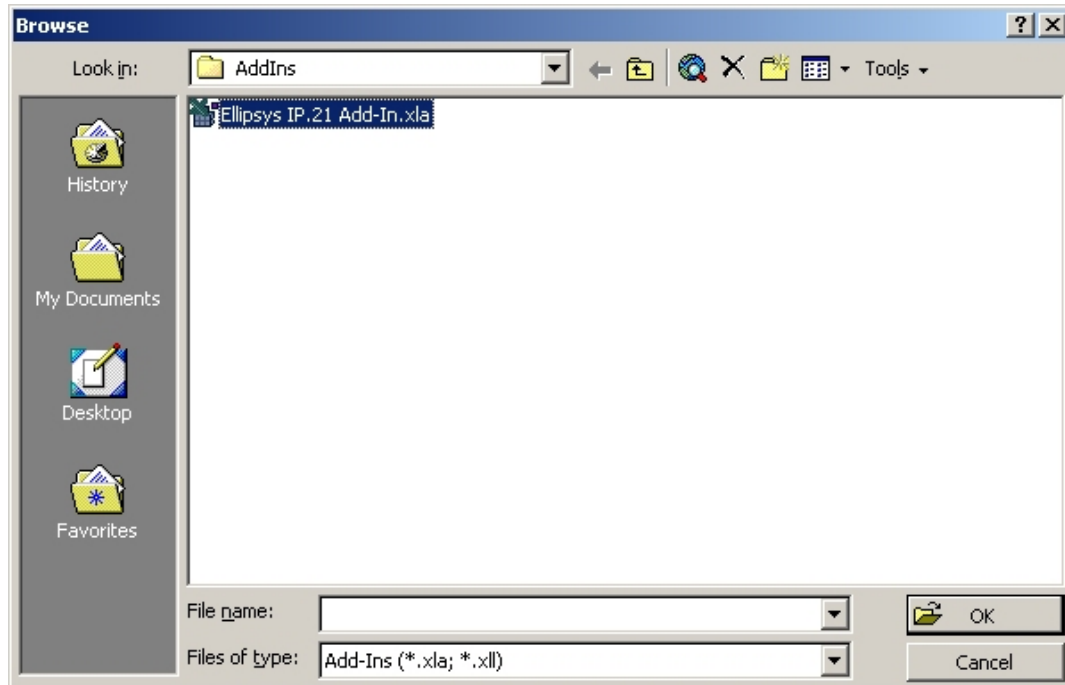
2.2.2 Silent Install

The E!QT setup.exe can be made to run silently as needed by SMS (Systems Management Server) or other remote software installation. A system administrator can record the steps of the E!QT install by using the **setup.exe /r** command and performing the steps of the install they desire. The **setup.exe /s** command can then be used to silently install via an SMS script.

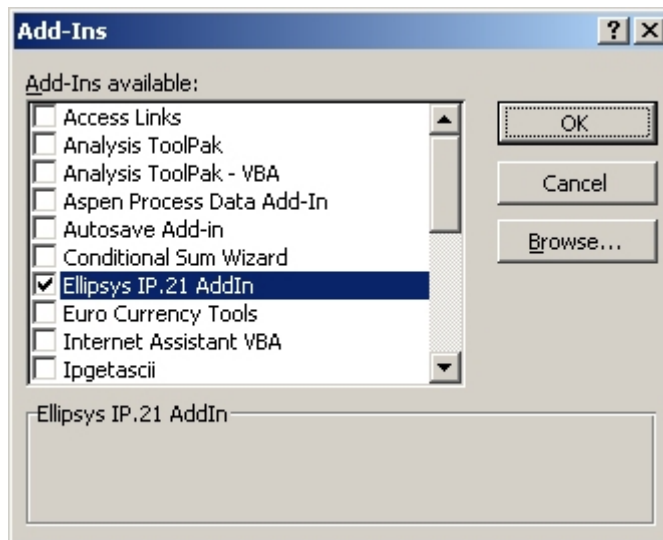
2.3 Configuration

Adding the E!QT Add-In is usually unnecessary if the user who installed it was the administrator of the machine. However, if your administrator installed it, the user can add the Add-In to get E!QT menu on Microsoft Excel menu bar.

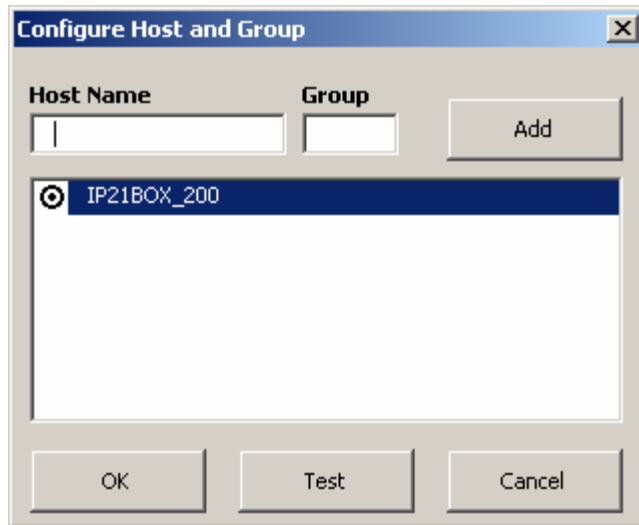
Once the Add-In has been installed, open Excel. Go to the Tools/Add-Ins... and click the Browse button. Select the Ellipsys IP.21 Add-In.xla from the directory where it was installed. C:\Program Files\Ellipsys\E!QT by default.



Click OK. Then make sure it is selected in the Add-In.



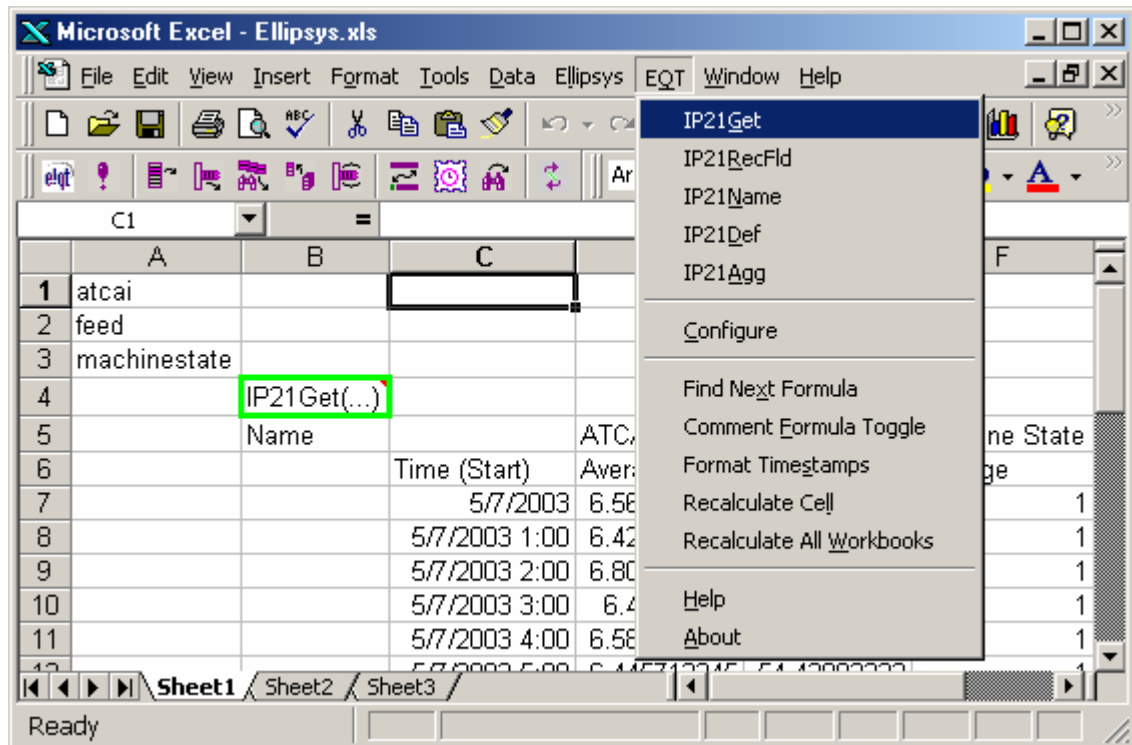
Once the Add-In is installed it must be configured to connect to an IP.21 server. Selecting the EIQT/Configure option opens the following dialog:



Here the user can enter the Host Name (IP.21 Server) and its Group (typically 200). The Host Name is the name that locates the computer on the network and can be specified as the fully qualified host name or its alias. Once the entry has been added and set to the default (the selected entry in the list box) the OK button can be clicked and the user will be prompted to save the entries. If any entries in the configuration are changed, the Test button will become invisible until the changes have been accepted by clicking on the OK button. This includes the initial configuration.

3 Using the E!QT

The E!QT consists of several functions that make retrieval of data from IP.21 into Excel quite easy. These functions consist of five data retrieval functions IP21Agg, IP21Def, IP21Get, IP21Name and IP21RecFld. Several time and interval functions have been defined to assist in defining periods of time to retrieve for the IP21Get and IP21Agg functions. See Section 4 for more details on each of these functions.



To activate any of the IP21 functions select them from the EQT menu or toolbar. The corresponding Ellipsys Query Tool form will activate. Many of the inputs on the forms allow either manually entered text or a specified Excel Range. In addition to these data retrieval and time functions, some macros designed to assist in report development have been added: Find Next Formula, Comment Formula, Format Timestamps, Recalculate Cell, and Recalculate All.

4 E!AddIn Functions

4.1 Data Retrieval Functions

The E!QT currently provides five data retrieval functions IP21Def, IP21RecFld, IP21Agg, IP21Get and IP21Name. These functions can be classified into single value and multi-value Excel formulae. Single value functions return a single value into the cell where they are called. These functions have very little overhead and are quite fast. Multi-value functions can return large amounts of data. E!QT returns this data as just values offset from the original formula cell. This method was chosen over using Excel formula arrays so very large amounts of data can be retrieved.

Single Value Functions:

- IP21Def returns the definition record for any tag in the IP.21 database.
- IP21RecFld returns the value of any record and field in the IP.21 database.
- IP21Agg returns an aggregate value of a single record (tag) for a given period of time.

Multi-Value Functions:

- IP21Get returns fixed area information as well as historical (aggregate or actual) data from one or more records (tags) in the database.
- IP21Name returns a list of record that match a search criterion.

4.2 IP21Def - Single Tag Definition Function

This function simply returns the name of the definition record of the tag. The IP21Def function can be accessed via the E!QT menu or toolbar shortcut. Selecting either of these will display the following GUI for entering the Host and Tag for the function.

Parameter	Cell	Description
Host Name	X	Excel reference to the Field Name
Host Name		Text of Field Name
Tag Name	X	Excel reference to the Record Name
Tag Name		Text of Record Name
Formula Destination	X	Excel Cell to place the formula

The IP21Def can also be used directly from an Excel spreadsheet by entering its formula:

=IP21Def (Host Name, Tag Name)

Parameter	Description
Host Name	Host name or Excel reference to the host name
Tag Name	Text of Record Name

Example:

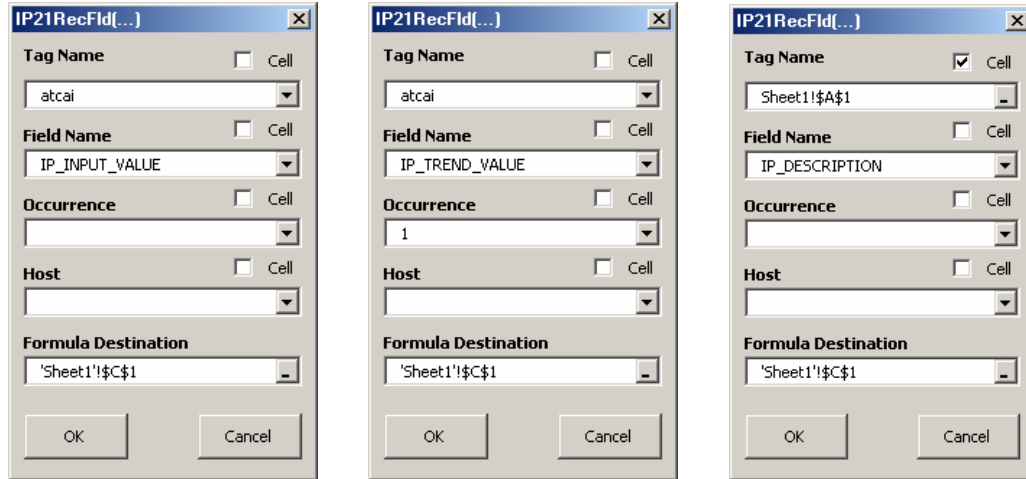
```
=IP21Def( "IP21_200", Sheet1!$A$1)
```

```
=IP21Def( Sheet1!$A$1, Sheet1!$B1)
```

```
=IP21Def( "", Sheet1!$A$1)
```

4.3 IP21RecFld - Single Record and Field Retrieval Function

The IP21RecFld function can be accessed via the E!QT menu. The GUI can use input from cell references or manually entered text.



The entries on the form are:

Parameter	Cell	Description
Tag Name	x	Excel reference to the Record Name
Tag Name		Text of Record Name
Field Name	X	Excel reference to the Field Name
Field Name		Text of Field Name
Occurrence	X	Excel reference to the Occurrence
Occurrence		Text of Occurrence
Host Name	x	Excel reference to the Host Name
Host Name		Text of Field Name
Formula Destination	X	Excel Cell to place the formula

The IP21RecFld can also be used directly from an Excel spreadsheet by entering its formula

=IP21RecFld(Host Name, Record Name, Occurrence, Field Name)

Parameter	Description
Host Name	Excel Cell or Text with the Host Name
Record Name	Excel Cell or Text with Record Name and Field
Occurrence	Excel Cell or Text with Occurrence (0 for none)
Field Name	Excel Cell or Text with Field Name

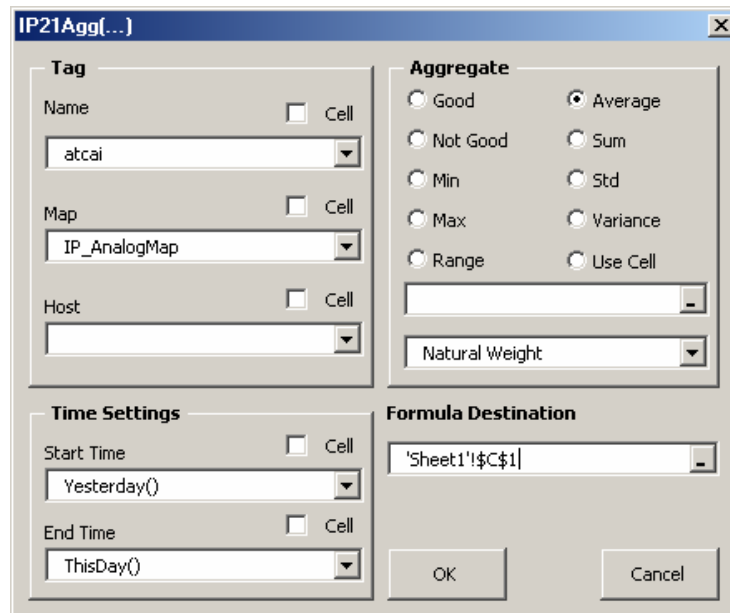
Example:

```
=IP21RecFld("IP21_200", "ATCAI", 0, "IP_VALUE")           = 3.75
=IP21RecFld("IP21_200", $A$1,0, $B$1)                   = 3.75*
=IP21RecFld("IP21_200", "IP_AnalogDef", 1, "FIELD_NAME_RECORD")
                                                           = IP_#_OF_TREND_VALUES
```

* Where \$A\$1 contains ATCAI and \$B\$1 contains IP_VALUE

4.4 IP21Agg – Single Tag Aggregate Function

The IP21Agg function can be accessed via the E!QT menu. This function is like a shortened version of the IP21Get. It returns a single value to the cell containing the formula. The GUI entries can use input from cells references or manually entered text, while others determine the type of data to retrieve.



Parameter	Cell	Description
Tag Range	X	Cell containing a Record name
Tag Range		Text of a Record name
Map Range	X	Cell containing an AtMapDef record
Map Range		Text of an AtMapDef record
Host	X	Cell containing a host name
Host		Text of Host name
Start Time	X	Cell containing the Start Time
Start Time		Text of Start Time
End Time	X	Cell or Text containing the End Time
End Time		Text of End Time
Formula Destination	X	Excel Cell to place the formula
Aggregate		Return the following Aggregate Data
Good		Number of Goods in the period
Not Good		Number of Not Goods in the period
Average		Average value during the period
Min		Minimum value during the period
Max		Maximum value during the period
Range		Range during the period (Max-Min)
Sum		Sum during period
Std		Standard deviation during the period
Variance		Variance during the period
Use Cell		Allows cell to be used in the control below
<i>Time Weight</i>		(see description below)

The IP21Agg can also be used directly from an Excel spreadsheet by entering its formula:

=IP21Agg(Host Name, Tag, Map, Start Time, End Time, Time Weight, Single History Mask)

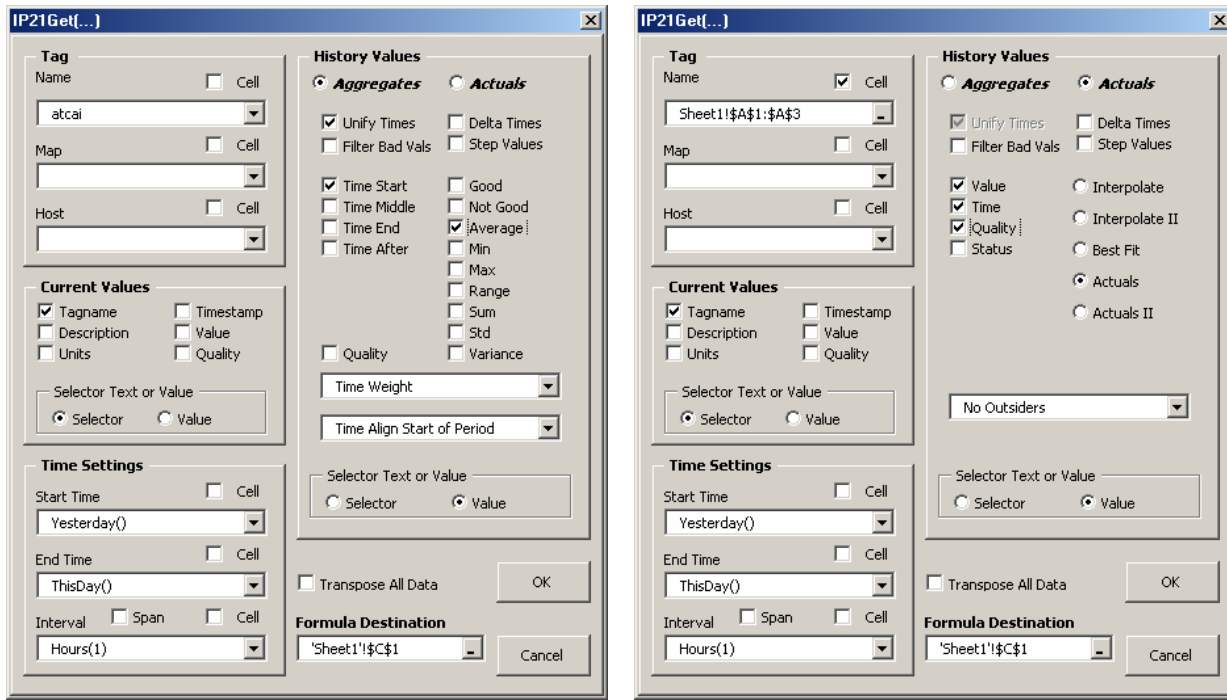
Parameter	Description
1. Host Name	Excel cell or text with the IP.21 host name
2. Tag	The record name or Excel range containing the record name.
3. Map	The ATMapDef record name or Excel range containing the ATMapDef record name. Use "" or same range as Tag if the DEFAULT ATMapDef record is desired.
4. Start Time	Excel cell or text with the time to start the history get. The time is expressed in Excel time formats using Excel Date/Time functions or the custom time functions. (See Time Functions Below)
5. End Time	Excel cell or text with the time to end the history get. The time is expressed in Excel time formats using Excel Date/Time functions or the custom time functions. (See Time Functions Below)
6. Time Weight	For Aggregate Data Only, this flag indicates how statistics should be calculated. 3 uses the best-fit method. All time periods are calculated, even those past the latest value. 2 uses the best-fit method. The time period containing the latest value is calculated, but none past this period are calculated. 1 uses the best-fit method. The time period containing the last value and those past the latest value are not calculated. 0 use actual values -1 uses actual values and includes the period containing the latest value. -2 uses actual values and includes all periods, even those starting after the latest value.
7. History Mask	Excel cell or text with the history mask. (See History Mask Table Below)

Example:

```
=IP21Agg( "IP21_200", $A$1, $B$1, Yesterday(), ThisDay(), 1, "AGG_AVG")
=IP21Agg( "IP21_200", A1, B1, C1, D1, 1, "AGG_AVG")
=IP21Agg( "IP21_200", A1, B1, C1, D1, 1, "AGG_SUM")
```

4.5 IP21Get - Multiple Tag History Retrieval Function

The IP21Get function can be accessed via the EIQT menu. Many of the GUI entries can use input from cells references or manually entered text, while others determine the type of data to retrieve.



The entries on the form with Aggregate/Actual checked:

Parameter	Cell	Description
Tag Range	X	Cell containing the Record name(s)
Tag Range		Text of a Record name
Map Range	X	Cell containing the AtMapDef record(s)
Map Range		Text of an AtMapDef record
Host	X	Cell containing a host name
Host		Text of Host name
Fixed Area		Return following Fixed Area Item
Tagname		Text containing Tag Name
Description		Text containing Description
Units		Text or Value of Units (see Selector/Value)
Current Timestamp		Time Value last updated (see Map record)
Current Value		Value last updated (see Map record)
Current Quality		Quality of last updated (see Map record)
Selector/Value		Return the Value or its Text representation
Start Time	X	Cell containing the Start Time
Start Time		Text of Start Time
End Time	X	Cell or Text containing the End Time
End Time		Text of End Time
Interval	X	Cell containing the Interval
Interval		Text of Interval
Span		Make the interval Span the Start and End Time
Aggregate/Actual		Select between Aggregated and Actual Values

Formula Destination	X	Excel Cell to place the formula
Aggregate		Return the following Aggregate Data
Time Start		The time at the start of the period
Time Middle		Time at the middle of the period
Time End		Time at the end of the period
Time After		Time of the next period
Good		Number of Goods in the period
Not Good		Number of Not Goods in the period
Average		Average value during the period
Min		Minimum value during the period
Max		Maximum value during the period
Range		Range during the period (Max-Min)
Sum		Sum during period
Std		Standard deviation during the period
Variance		Variance during the period
Quality		Quality during the period
<i>Unify Times</i>		Display only a single row/column of time(s)
<i>Delta Times</i>		Display times as differences in 10ths of seconds from the Time Start
<i>Step Values</i>		Step the values between times
<i>Filter Bad Values</i>		Filter bad status (NAN) or 0 values from data
<i>Time Weight</i>		(see description below)
<i>Time Alignment</i>		(description below)
<i>Selector/Value</i>		Return the Value or its Text representation
Actual		Return the following Actual Data
Value		Value depending upon method
Time		Timestamp depending upon method
Quality		Quality
Status		Status
Methods *		(Specify one of the following) *
Interpolate		Interpolate to nearest time periods (T1-T2)/occs
Interpolate II		Interpolate to nearest time periods (T1-T2)/occs-1
Best Fit		Use best fit curve to data
Actuals		Actual Data
Actuals II		Actual Data and current value
Unify Times **		Display only a single row/column of time(s)**
<i>Delta Times</i>		Display times as differences in 10ths of seconds from the Time Start
<i>Step Values</i>		Step the values between times
<i>Filter Bad Values</i>		Filter bad status (NAN) or 0 values from data
<i>Include Outsiders</i>		Future functionality from AspenTech
<i>Selector/Value</i>		Return the Value or its Text representation

* Actual values for Setcim/IPX only return raw trend data regardless of the Method selected.

** Unify Time Columns is not available for Actuals or Actuals II for obvious reasons.

Notes:

When the IP21Get function returns data it will return one extra blank column and row. Since the number of rows and columns is not known in advance, developing reports should be done carefully to avoid overwriting other rows/columns of data or other formulae. When the IP21Get function is used to retrieve only fixed area values, one additional blank row is returned.

The IP21Get can also be used directly from an Excel spreadsheet by entering its formula:

=IP21Get(Host Name, Tags, Maps, Start Time, End Time, Interval, Time Weight, Fixed Mask, History Mask)

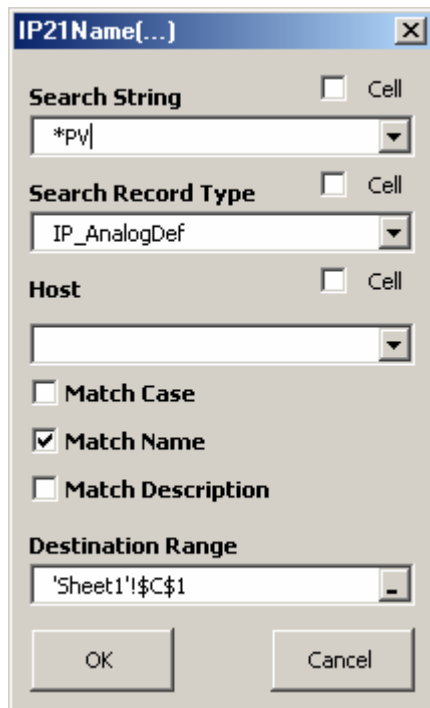
Parameter	Description
1. Host Name	Excel cell or text with the IP.21 host name
2. Tags	Excel range with record Name(s). An Excel range is required because IP.21/Setcim can use any typeable character. Therefore there is no suitable delimiter to allow a single line of text with multiple tags.
3. Maps	Excel range with the ATMapDef record(s) to use for the corresponding tag. Use "" or same range as Tags if the DEFAULT ATMapDef record is desired.
4. Start Time	Excel cell or text with the time to start the history get. The time is expressed in Excel time formats using Excel Date/Time functions or the custom time functions. (See Time Functions Below)
5. End Time	Excel cell or text with the time to end the history get. The time is expressed in Excel time formats using Excel Date/Time functions or the custom time functions. (See Time Functions Below)
6. Interval	Excel cell or text with the interval to retrieve data. The interval is expressed in fractions of days or using the custom interval functions. (See Interval Functions Below)
7. Time Weight	For Aggregate Data Only, this flag indicates how statistics should be calculated. 3 uses the best-fit method. All time periods are calculated, even those past the latest value. 2 uses the best-fit method. The time period containing the latest value is calculated, but none past this period are calculated. 1 uses the best-fit method. The time period containing the last value and those past the latest value are not calculated. 0 use actual values -1 uses actual values and includes the period containing the latest value. -2 uses actual values and includes all periods, even those starting after the latest value.
8. Time Align	Future AspenTech Functionality
9. Fixed Mask	Excel cell or text with the Fixed Mask. (See Fixed Mask Below)
10. History Mask	Excel cell or text with the history mask. (See History Mask Below)

Example:

=IP21Get("IP21_200", Sheet1!\$A\$1:\$A\$2, Sheet1!\$B\$1:\$B\$2, Yesterday(), ThisDay(), hours(1), 1, "FIX_TAG", "AGG_START+AGG_AVG")

4.6 IP21Name - Tag Search Function

E!QT includes a simple tag search mechanism to find tags in the database. This function will return the tags, their description and the node where they were found in 3 columns specified by the Destination Range. Valid wild-cards for the search string include * and ?, which represent the many and single character replacements respectively. The Search Record Type can be left blank to search all records or it can contain a definition record such as IP_AnalogDef or IP_DiscreteDef. Additionally, the Search can be made to match the case of the Tag or Description. If several hosts have been configured, a specific host can be specified to speed the search as well. Fastest tag searches can be achieved when a Name Search String, a Search Record Type and Match Case are specified.



The screenshot shows a dialog box titled "IP21Name(...)" with the following fields and options:

- Search String:** A dropdown menu containing the text "*pv|". To its right is a checkbox labeled "Cell" which is unchecked.
- Search Record Type:** A dropdown menu containing the text "IP_AnalogDef". To its right is a checkbox labeled "Cell" which is unchecked.
- Host:** An empty dropdown menu. To its right is a checkbox labeled "Cell" which is unchecked.
- Match Case:** An unchecked checkbox.
- Match Name:** A checked checkbox.
- Match Description:** An unchecked checkbox.
- Destination Range:** A text input field containing the formula "'Sheet1'!\$C\$1".

At the bottom of the dialog box are two buttons: "OK" and "Cancel".

4.7 Time Functions

There are several time functions built into Excel, including Date() and Today(). Currently the **Now()** and **Date()** functions should be *avoided* due to their rapid recalculation. Any versions of **NOW** entered via the GUI will be automatically changed to the **ThisMinute()** function. Additionally, times can be entered as constants, cell references or using several custom time functions have been created. All of the arguments for the custom time functions are optional with the exception of the AddToDate. **Examples are given current date/time: September 26, 2001 13:50:00**

Acceptable Times

Today()

9/26/2001

ThisMinute(Days Offset, Hours Offset, Minutes Offset, Seconds Offset)

```
ThisMinute ( )           = 26-Sep-01 13:50:00.0
ThisMinute (,-1)        = 26-Sep-01 12:50:00.0
ThisMinute (-1)         = 25-Sep-01 13:50:00.0
```

ThisHour(Days Offset, Hours Offset, Minutes Offset, Seconds Offset)

```
ThisHour ( )            = 26-Sep-01 13:00:00.0
ThisHour (,-1)          = 26-Sep-01 12:00:00.0
ThisHour (-1)           = 25-Sep-01 13:00:00.0
```

ThisDay(Days Offset, Hours Offset, Minutes Offset, Seconds Offset)

```
ThisDay( )              = 26-Sep-01 00:00:00.0
ThisDay(-1)             = 25-Sep-01 00:00:00.0
ThisDay(,-1)            = 25-Sep-01 23:00:00.0
```

Yesterday(Days Offset, Hours Offset, Minutes Offset, Seconds Offset)

```
Yesterday( )           = 25-Sep-01 00:00:00.0
Yesterday(-1)          = 24-Sep-01 00:00:00.0
Yesterday(,-1)         = 24-Sep-01 23:00:00.0
```

Tomorrow(Days Offset, Hours Offset, Minutes Offset, Seconds Offset)

```
Tomorrow( )            = 27-Sep-01 00:00:00.0
Tomorrow(-1)           = 26-Sep-01 00:00:00.0
Tomorrow(,-1)          = 26-Sep-01 23:00:00.0
```

ThisMonth(Days Offset, Hours Offset, Minutes Offset, Seconds Offset)

```
ThisMonth( )           = 01-Sep-01 00:00:00.0
ThisMonth(-1)          = 31-Aug-01 00:00:00.0
ThisMonth(,-1)         = 31-Aug-01 23:00:00.0
```

LastMonth(Days Offset, Hours Offset, Minutes Offset, Seconds Offset)

```
LastMonth( )           = 01-Aug-01 00:00:00.0
LastMonth(-1)          = 31-Jul-01 00:00:00.0
LastMonth(,-1)         = 31-Jul-01 23:00:00.0
LastMonth(1)           = 01-Sep-01 00:00:00.0
```

NextMonth(Days Offset, Hours Offset, Minutes Offset, Seconds Offset)

```
NextMonth( )           = 01-Oct-01 00:00:00.0
NextMonth(-1)          = 30-Sep-01 00:00:00.0
NextMonth(,-1)         = 30-Sep-01 23:00:00.0
```

```

ThisYear(Days Offset, Hours Offset, Minutes Offset, Seconds Offset)
ThisYear()           = 01-Jan-01 00:00:00.0
ThisYear(-1)        = 31-Dec-00 00:00:00.0
ThisYear(,-1)       = 31-Dec-00 23:00:00.0

```

```

AddToDate(Interval, Offset, Start Time)
AddToDate("m",-1,ThisMonth())      = 01-Aug-01 00:00:00.0
AddToDate("yyyy",-1,ThisYear())    = 01-Jan-00 00:00:00.0
AddToDate("q",-1,ThisYear())       = 01-Oct-00 00:00:00.0

```

Other valid Intervals for the AddToDate function include:

yyyy	Year
q	Quarter
m	Month
y	Day of year
d	Day
w	Weekday
ww	Week of year
h	Hour
n	Minute
s	Second

4.8 Interval Functions

Time differences in Excel are represented in fractions of days. The add-in functions can use these fractions, text formatted like "HHHHH:MM:SS" or any combination of the following custom functions.

Acceptable Intervals

Expressed in HHH:MM:SS

"01:00:00"	=	0.041667...
"24:00:00"	=	1
"168:00:00"	=	7

Days(Number Days)

Days(1)	=	1
Days(0)	=	0
Days(-1)	=	-1

Hours(Number Hours)

Hours(1)	=	1/24	=	0.041667...
Hours(0)	=	0/24	=	0
Hours(-1)	=	-1/24	=	- 0.041667...

Minutes(Number Minutes)

Minutes(1)	=	1/24/60	=	6.944...e-4
------------	---	---------	---	-------------

Seconds(Number Seconds)

Seconds(1)	=	1/24/60/60	=	1.157407407...e-5
------------	---	------------	---	-------------------

4.9 Fixed Area Masks

The fixed area masks are used to determine which fixed area items are retrieved from the records. In all cases the IP21Get function will try to reference the ATMapDef record which is set as the default for the record definition in question, unless the map record is specified.

Fixed Area Mask	Description
FIX_TAG	Returns the tag name with the data set.
FIX_UNIT	Returns the tag units with the data set.
FIX_DESC	Returns the tag description with the data set
FIX_TIME	Returns the current timestamp
FIX_VALUE	Returns the current data value
FIX_QUAL	Returns the current quality
FIX_ALLSET	Return all the fixed area items
FIX_MASK_SELECTOR	Return the Value or its Text representation

4.10 History Area Masks

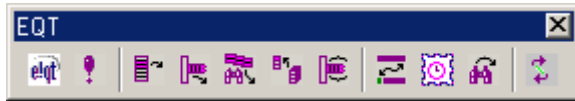
The history area masks are used to determine which history area items are retrieved from the records and which type of history to retrieve (aggregate or actual). In all cases the IP21Get function will try to reference the ATMapDef record which is set as the default for the record definition in question, unless the map record is specified.

Actual Masks	Description
ACT_TIME	Returns the timestamp for each data value
ACT_VALUE	Returns the value for each data value
ACT_QUAL	Returns the quality for each data value
ACT_STAT	Returns the status for each data value
Type of History to get	Only one can be selected at a time
ACT_GET_INT1	Interpolate
ACT_GET_INT2	Interpolate
ACT_GET_BEST_FIT	Best Fit
ACT_GET_ACT_ONLY	Actual Values
ACT_GET_ACT_AND_CURRENT	Actual Values and Current
HIS_FILTER	Filter bad status (NAN) or 0 values from data
HIS_MASK_SELECTOR	Return the Value or its Text representation
HIS_UNIFY	Unify the Time column(s) selected
HIS_DTIME	Return Delta Times
HIS_STEP	Step the values
HIS_TRANSPOSE	Transpose the data

Aggregate Masks	Description
AGG_START	Time at beginning of period
AGG_MIDDLE	Time at middle of period
AGG_END	Time at end of period
AGG_AFTER	Time after end of period (start of next period)
AGG_GOOD	Good values
AGG_NG	Not good values
AGG_MIN	Minimum
AGG_MAX	Maximum
AGG_RNG	Range
AGG_SUM	Sum
AGG_AVG	Average
AGG_VAR	Variance
AGG_STD	Standard deviation
AGG_QUAL	Quality
HIS_FILTER	Filter bad status (NAN) or 0 values from data
HIS_MASK_SELECTOR	Return the Value or its Text representation
HIS_UNIFY	Unify the Time column(s) selected
HIS_DTIME	Return Delta Times
HIS_STEP	Step the values
HIS_TRANSPOSE	Transpose the data

4.11 Miscellaneous

Several macros have been added to make developing spreadsheets easier. Most of these have been added to a custom ToolBar EQT.



From left to right these are:

- Recalculate All Workbooks
 - Even if Calculation is set to Manual
- Recalculate Cell
 - This does not occur if Calculation is set to Manual
- IP21RecFld
 - Bring up the IP21RecFld dialog
- IP21Get
 - Bring up the IP21Get dialog to get data
- IP21Name
 - Bring up the IP21Name dialog to search for tags.
- IP21Def
 - Bring up the IP21Def dialog to get a tag definition record.
- IP21Agg
 - Bring up the IP21Agg dialog to get a tag aggregate.
- Formula Comment Toggle
 - Comment out a formula or Uncomment it if it is commented
- Format Timestamp
 - Format the selected Range to MM/DD/YYYY HH:MM:SS
- Find Next Formula
 - Find the next IP21 Formula in all open workbooks
- Reconnect
 - Reconnect to all configured IP.21/Setcim databases

5 Advanced Troubleshooting

The E!QT will report various errors when it or the database is improperly configured. The IP21Get “Function” reports the most common errors. Below is a table with the error and possible causes.

Error	Cause
Database connection error E	No database connection. Try configuring one. Or see section on running the INISETC.EXE for further troubleshooting.
Start time conversion ERROR	1) The Start Time may not be valid. 2) No database connection.
End time conversion ERROR	The End Time is not a valid date/time.
Failed To Read History - Invalid key time stamp	Aggregate functions require key time-stamps in history repeat areas to function properly. (See Note)
Invalid Record ID	The record is not in the configured databases.
No Map Field Specified	The AtMapDef record doesn't have the specified field configured correctly.
Invalid Map Record	There is no AtMapDef record for the record type (i.e. Definition) of the requested Tag.
Bad Excel Destination	The destination cell for the IP21Get is erroneous.
Bad Tag Input	The Tag range for the IP21Get is erroneous.
Invalid request for Aggregate & Actual	The IP21Get formula has entries for both Aggregates and Actuals. Only one type may be requested at a time.
Unknown Exception	These should be reported to support@ellipsys.com.
Invalid field type	The field specified IP21RecFld is erroneous.
No such record	The record is not in the configured databases.
Too many rows/columns requested	Excel can only hold 255 columns and 65535 rows.
When using Unify Times, the values on the database fields do not match	This is often due to tags having different history creation dates. This can be rectified by changing the History creation date on tags so to a later date.

Note to Setcim 4.9 users: E!QT uses the AspenTech's aggregate APIs for the E!QT add-in functions: IP21Get and IP21Agg. The aggregate API(s) require Key Timestamps in history repeat areas to function properly. AspenTech provides utilities to add Key Timestamps to the numerical count field of the history repeat area. Please refer to the Setcim 4.9 release notes for information on configuring key timestamps. Also, refer to AspenTech Knowledge Base solution ID 104839.

Ellipsys provides a utility program called INISETC.EXE in the directory where E!QT is installed. (Usually this is the C:\Program Files\Ellipsys\EQT\Document. This program may be used at the command prompt to test connectivity to the database.

To access the utility open the Start/Run dialog and type CMD.

```
C:\> CD C:\Program Files\Ellipsys\EQT\Document
C:\Program Files\Ellipsys\EQT\Document> INISETC
E!RPC                Ver 2.0.0.1                28 January 2002        /rla 1

Test RPC Connection:  Established

For more info use syntax:
inisetc.exe          /e TagName
inisetc.exe          /u TagName Host [Group]

Where:
    /e uses the environment variable SETCIMRPC
    /u uses user defined Host and Group
inisetc.exe Complete.

Example of an unavailable server
C:\Program Files\Ellipsys\EQT\Document> INISETC /u ATCAI IP21SERVER
E!RPC                Ver 2.0.0.1                28 January 2002        /rla 4

Test RPC Connection:  Established

Error Adding Server ip21server - E Connection Failure is Fatal.

INISETC Complete.

Example of an available server
C:\Program Files\Ellipsys\EQT\Document> INISETC /u ATCAI IP21SERVER
E!RPC                Ver 2.0.0.1                28 January 2002        /rla 4

Test RPC Connection:  Established

atcai                = ATCAI
Record ID            = 1721
Node ID              = 1

INISETC Complete.
```