

PLANTSCAPE SERVER

DATA IMPORT/EXPORT - 1

TABLE OF CONTENTS

Cut, Copy Paste.....	5
Cut, Copy, Paste from Trends.....	5
Editing aid.....	5
Network Serving of Data.....	6
Overview.....	6
Microsoft Excel Data Exchange.....	7
Overview.....	7
Installation	7
Starting the Wizard	7
Step 1	7
Step 2 Point Values or History Values.....	8
Step 3 Point Values.....	9
Step 3 History Values	11
Step 4 History Values	12
Update Values.....	14
Using Cell Formulae	15
Can't find MS Excel Data Exchange?	16
Difficulty opening an existing file on another PC?.....	16
Lab Exercises – Microsoft Excel Data Exchange	17
OPC.....	18
Introduction.....	18
What is OPC?.....	18
OPC Groups and Items	18
Report by Exception	19
Background Scan	19
Schematic Diagram.....	19
PlantScape OPC Server.....	20
Introduction.....	20
Setting up the PlantScape OPC Server for use with a Third Party OPC Client	20
PlantScape OPC Interface	22
Introduction.....	22
Configuring the PlantScape OPC Interface.....	22
Network Node Interface	25
Overview.....	25
How to implement Network Node Interface.....	25
Lab Exercises - Network Node Interface	26

SESSION OBJECTIVES

At the end of this section of the course the student will be able to:

- Cut data from a Trend page and Paste it into a Microsoft Excel spreadsheet
- Configure Microsoft Excel Data Exchange to export Plantscape Server data to a Microsoft Excel spreadsheet
- Use the PlantScape OPC Server and Client to connect to other OPC Clients and Servers
- Use Network Node Interface to configure one Plantscape Server to be a Controller to another Plantscape Server

REFERENCES

Knowledge Builder: Server and Client Configuration Guide→
Using PlantScape data in other Applications→
Using Microsoft Excel Data Exchange

Quick Builder Online Help

Cut, Copy Paste

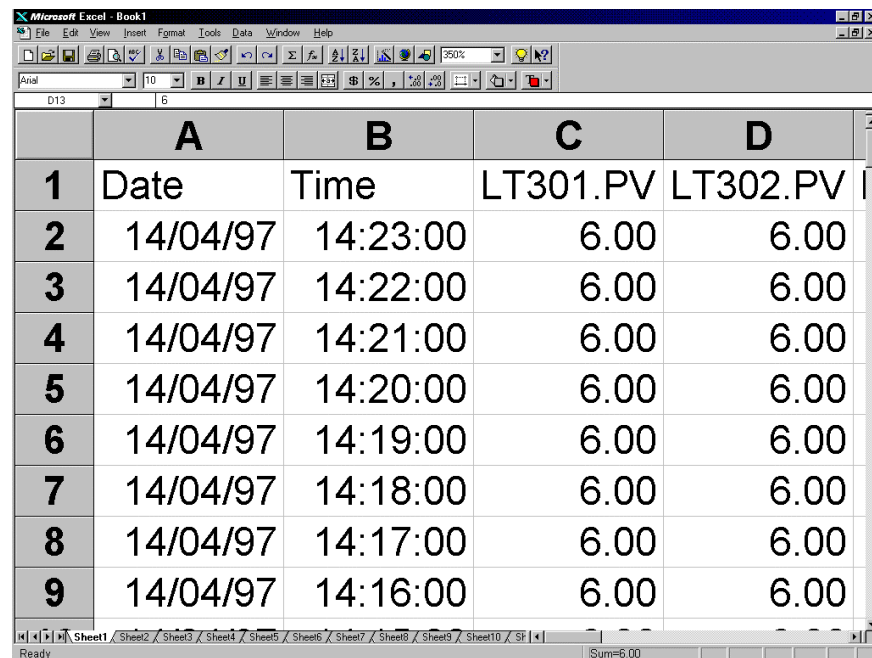
Cut, Copy, Paste from Trends

A simple, but very effective method for copying trend data into third party packages such as Microsoft Excel

Simply click on the chart of any trend page and choose **Edit→Copy** to copy the data values to the clipboard.

Then switch to an Excel spreadsheet and choose **Edit→Paste**.

The values in the spreadsheet are static and will not update.



The screenshot shows a Microsoft Excel window titled 'Book1'. The spreadsheet has columns A, B, C, and D, and rows 1 through 9. The data is as follows:

	A	B	C	D
1	Date	Time	LT301.PV	LT302.PV
2	14/04/97	14:23:00	6.00	6.00
3	14/04/97	14:22:00	6.00	6.00
4	14/04/97	14:21:00	6.00	6.00
5	14/04/97	14:20:00	6.00	6.00
6	14/04/97	14:19:00	6.00	6.00
7	14/04/97	14:18:00	6.00	6.00
8	14/04/97	14:17:00	6.00	6.00
9	14/04/97	14:16:00	6.00	6.00

The status bar at the bottom shows 'Ready' and 'Sum=6.00'.

Historic values pasted into an Excel spreadsheet

Editing aid

Cut, Copy and Paste can also be used during configuration activities to copy point names, or similar text items, to the clipboard for pasting into other locations.

Network Serving of Data

Overview

We will examine three of the options available for exporting real time data from a Plantscape Server database to a client:

- Microsoft Excel Data Exchange
- Network Node Interface

Attention

The Network Server option must be installed in any Plantscape Server which is to have its database accessed by either of these two methods.

- OPC Client and Server
-

Microsoft Excel Data Exchange

Overview

Microsoft Excel Data Exchange is a method of reading data from a Plantscape Server realtime database over a TCP/IP network to an Excel 95 (ver 7) or Excel 97 (ver 8) spreadsheet.

When using the supplied Wizard links can be created to either current point parameters or historical values.

Cell formulae can be created to link to any parameter in the PlantScape Server database.

Installation

The Microsoft Excel Data Exchange option is supplied on the PlantScape CD-ROM.

It must be installed on the client PC, by the user who will be using it, after Microsoft Excel is installed.

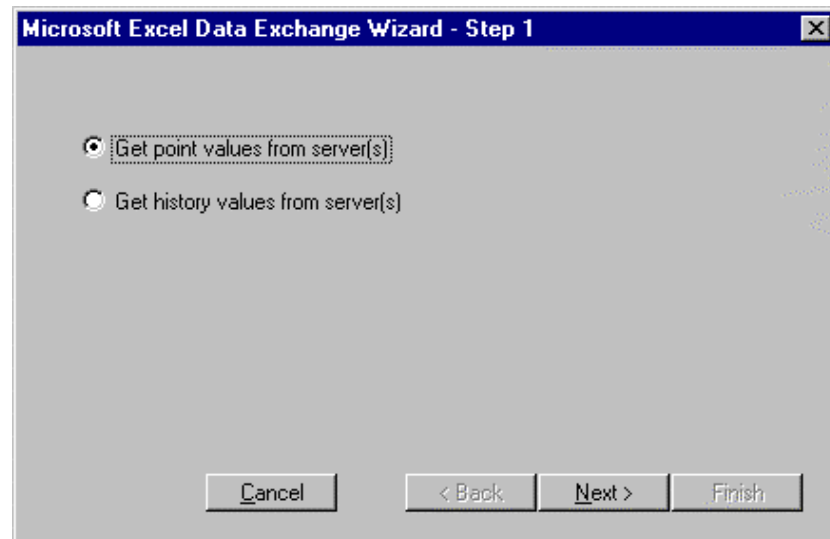
It may be installed to have read/write or read only access to the PlantScape Server database,

Starting the Wizard

The Wizard is started from an Excel spreadsheet by choosing

Tools→Microsoft Excel Data Exchange→Wizard

Step 1



Choose **Get point values from server(s)** or **Get history values from server(s)** and click **Next>**.

Microsoft Excel Data Exchange.....continued

Step 2 Point Values or History Values

Microsoft Excel Data Exchange Wizard - Step 2 of 3

Server: s3knta (lists the most recent choices)

Point ID: LT303

Point Parameter: PV

Buttons: Add, Remove

List box contents: s3knta, LT301, PV; s3knta, LT302, PV

Bottom buttons: Cancel, < Back, Next >, Finish

Define the required values as follows:

Server	<p>Hostname (not IP address) of the PlantScape server to/from which data is to be transferred.</p> <p>▼ drops a list of recent choices.</p>
Point ID	<p>Point Name required.</p> <p>▼ drops a list of recent choices.</p>
Point Parameter	<p>Point Parameter required.</p> <p>▼ drops a list of all the parameter names.</p>
Add	Adds the currently defined Server,Point ID,Point Parameter to the list in the white area.
Remove	<p>Removes the currently selected <i>Server,Point ID,Point Parameter</i> from the list in the white area.</p> <p>Multiple selections can be made by using <Shift>+Click, or <Ctrl>+Click.</p>

Finish Step 2 by clicking **Next>**.

Microsoft Excel Data Exchange.....continued

Step 3 Point Values

Define the required values as follows:

Arrange Data	Select whether multiple point values will be displayed in a horizontal or vertical format (see below).
Display Options	Select whether or not to label the point values with: <ul style="list-style-type: none"> • Server Name • Point Name • Parameter Name
Paste Values	When checked, values will be pasted into spreadsheet and not updated. Use this option if the data is required as a “one off”. When unchecked, values entered into spreadsheet will be able to be updated. Use this option if the spreadsheet is to be re-used.
Minimise number of server calls	When checked, ensures that all the values in the defined array will be retrieved from the server with a minimum number of queries. <div style="border: 1px solid black; padding: 5px; text-align: center;"> Attention Do not uncheck this option. </div>

Microsoft Excel Data Exchange.....continued

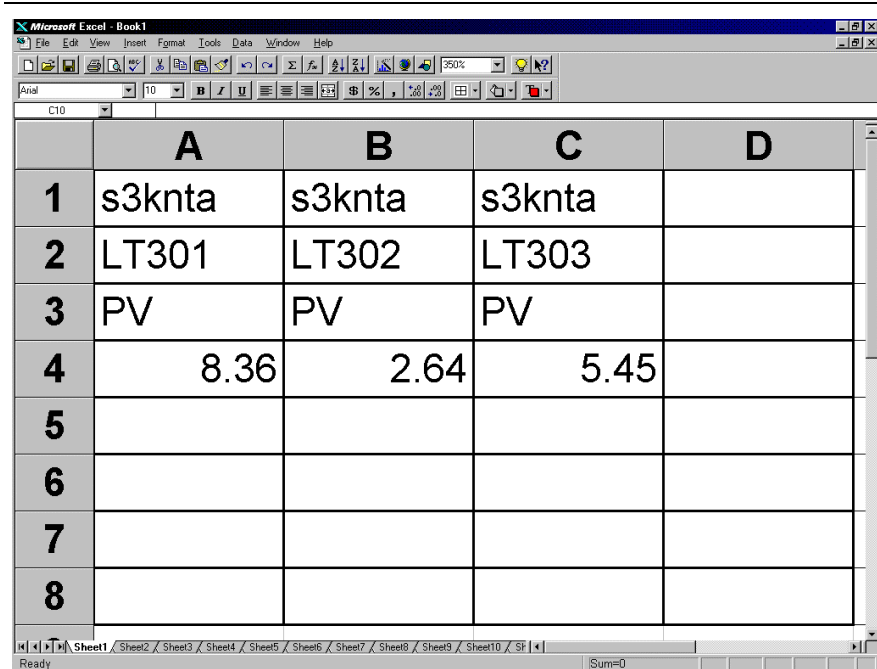
Step 3

Point Values

.....continued

Finish Step 3 by clicking **Finish**.

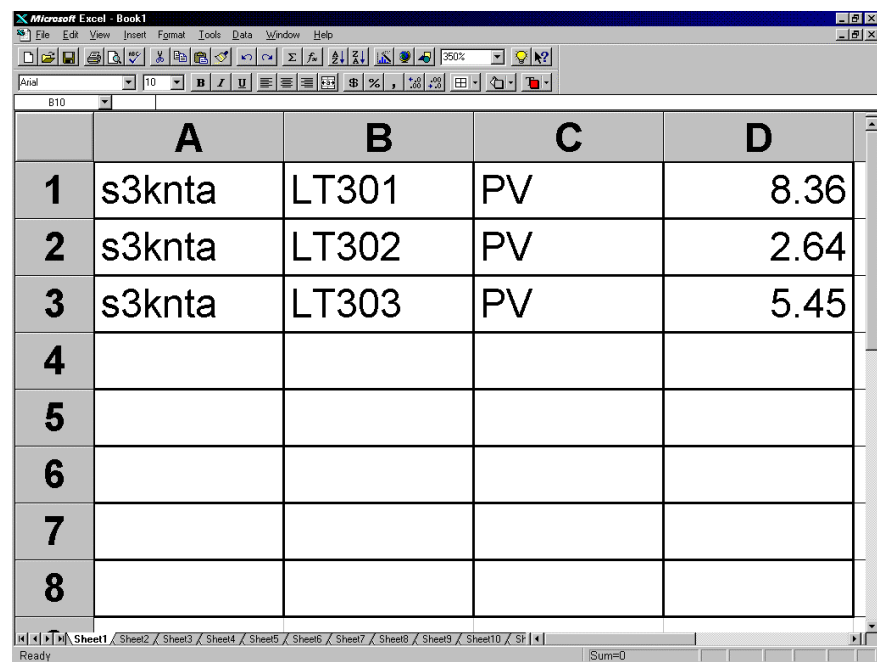
The following will be displayed on the spreadsheet:



The screenshot shows the Microsoft Excel interface with a spreadsheet titled 'Book1'. The spreadsheet has columns A, B, C, and D, and rows 1 through 8. The data is arranged horizontally, with each row containing the same three items: 's3knta', 'LT301', and 'PV' in columns A, B, and C respectively. The values 8.36, 2.64, and 5.45 are displayed in column D for rows 1, 2, and 3 respectively. The status bar at the bottom indicates 'Ready' and 'Sum=0'.

	A	B	C	D
1	s3knta	s3knta	s3knta	
2	LT301	LT302	LT303	
3	PV	PV	PV	
4	8.36	2.64	5.45	
5				
6				
7				
8				

Data Arranged Horizontally



The screenshot shows the Microsoft Excel interface with a spreadsheet titled 'Book1'. The spreadsheet has columns A, B, C, and D, and rows 1 through 8. The data is arranged vertically, with each column containing the same three items: 's3knta', 'LT301', and 'PV' in rows 1, 2, and 3 respectively. The values 8.36, 2.64, and 5.45 are displayed in column D for rows 1, 2, and 3 respectively. The status bar at the bottom indicates 'Ready' and 'Sum=0'.

	A	B	C	D
1	s3knta	LT301	PV	8.36
2	s3knta	LT302	PV	2.64
3	s3knta	LT303	PV	5.45
4				
5				
6				
7				
8				

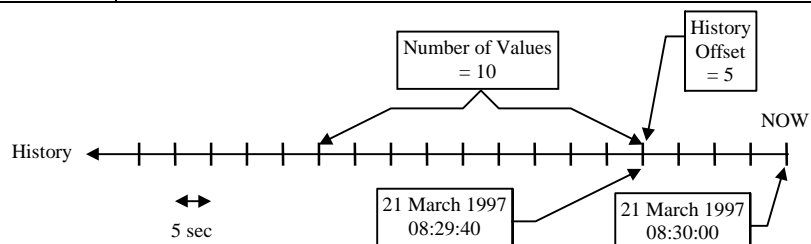
Data Arranged Vertically

Microsoft Excel Data Exchange.....continued

Step 3 History Values

Define the required values as follows:

History Type	Select the required history file from the drop down list.
Number of values	Enter the number of history values that you wish to display for each point.
Retrieve History by	<p>Check either:</p> <p>Offset Enter the number of history samples back from NOW from when you want to start collecting your history values</p> <p>or:</p> <p>Date/Time Enter the date and time from when you want to start collecting your history values (Excel will interpret your date format according to the Windows International settings)</p>

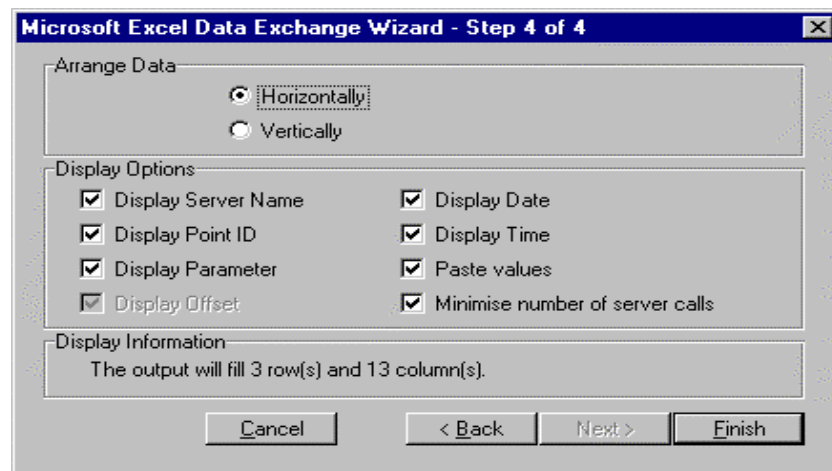


Microsoft Excel Data Exchange.....continued

Step 3 History Valuescontinued

Finish Step 3 by clicking **Next>**.

Step 4 History Values



Define the required values as follows:

Arrange Data	Select whether multiple point values will be displayed horizontally or vertically (see below).
Display Options	Select whether or not to label the point values with: <ul style="list-style-type: none">• Server Name• Point Name• Parameter Name• History Offset• Date• Time
Paste Values	When checked, values will be pasted into spreadsheet and not updated. Use this option if the data is required as a “one off”. When unchecked, values entered into spreadsheet will be able to be updated. Use this option if the spreadsheet is to be re-used.
Minimise number of server calls	When checked, ensures that all the values in the defined array will be retrieved from the server with a minimum number of queries. <div>Attention Do not uncheck this option.</div>

Microsoft Excel Data Exchange.....continued

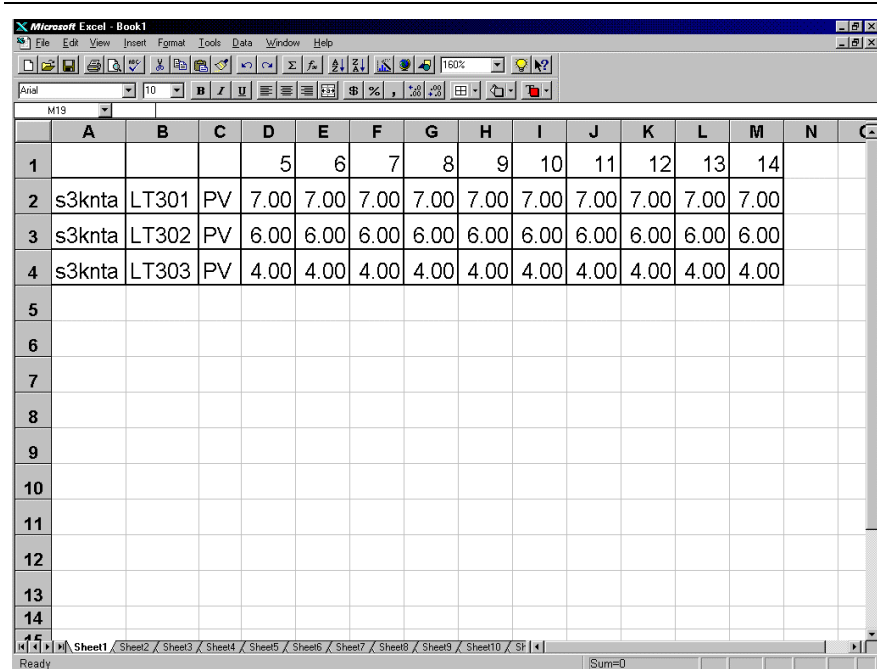
Step 4

History Values

.....continued

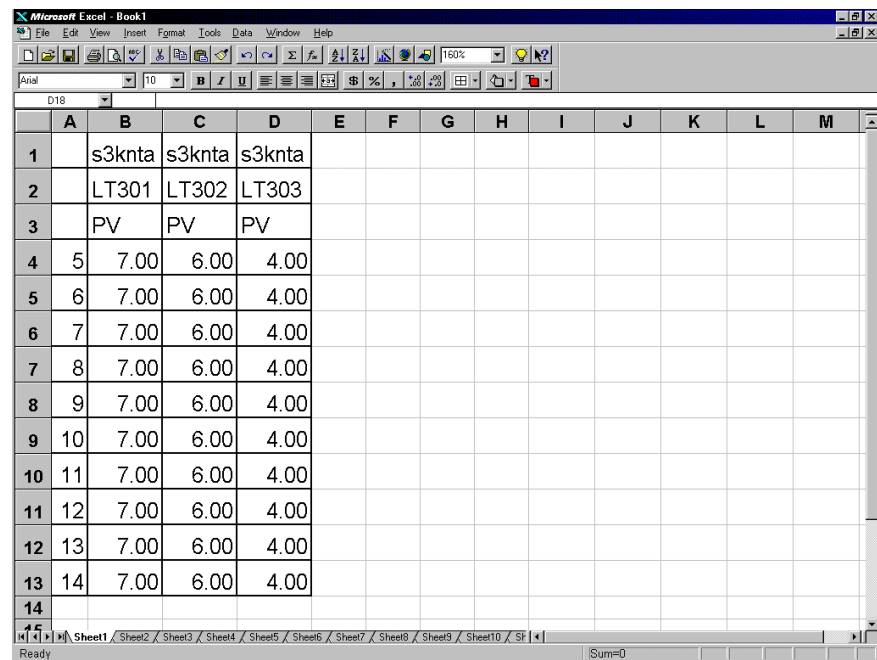
Finish Step 4 by clicking **Finish**.

The following will be displayed on the spreadsheet:



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1				5	6	7	8	9	10	11	12	13	14		
2	s3knta	LT301	PV	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00		
3	s3knta	LT302	PV	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00		
4	s3knta	LT303	PV	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00		
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															

Data Arranged Horizontally



	A	B	C	D	E	F	G	H	I	J	K	L	M
1		s3knta	s3knta	s3knta									
2		LT301	LT302	LT303									
3		PV	PV	PV									
4	5	7.00	6.00	4.00									
5	6	7.00	6.00	4.00									
6	7	7.00	6.00	4.00									
7	8	7.00	6.00	4.00									
8	9	7.00	6.00	4.00									
9	10	7.00	6.00	4.00									
10	11	7.00	6.00	4.00									
11	12	7.00	6.00	4.00									
12	13	7.00	6.00	4.00									
13	14	7.00	6.00	4.00									
14													

Data Arranged Vertically

Microsoft Excel Data Exchange.....continued

Update Values

If the Excel spreadsheet has been configured for manual recalculation (**Tools→Options...→Calculation**) the values may be updated by pressing <F9>.

If the Excel spreadsheet has been configured for automatic recalculation the recalculation interval is configured by choosing **Tools→Microsoft Excel Data Exchange→Set Recalculation Interval** and entering the required interval.

Attention

The recalculation interval is the time between the end of one spreadsheet calculation and the start of the next.

Zero (0) seconds means
NO AUTOMATIC RECALCULATION

Preset intervals of 5 seconds and 30 seconds are available.

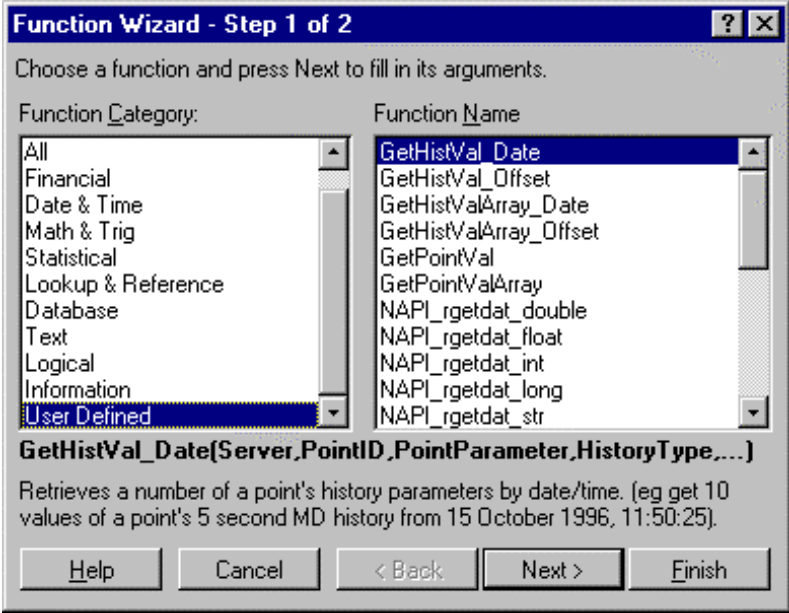
Automatic recalculation of the values can be turned off by choosing:
Tools→Microsoft Excel Data Exchange→Stop Recalculation

Microsoft Excel Data Exchange.....continued

Using Cell Formulae

Instead of using the Wizard to retrieve point parameters it is possible to enter a formula directly into a spreadsheet cell.

The following steps describe the procedure:

Step	Action
1	In the Microsoft Excel spreadsheet select a cell, or range of cells, where the data is required to appear.
2	Click in the Formula Bar, then click fx . The Excel Function Wizard will appear: 
3	Scroll down the Function Category list and select User Defined .
4	Scroll through the Function Name list, choose the required function, and click Next> to display Step 2 of the Wizard.
5	Enter the required details and click Finish . The required data should now be displayed in the spreadsheet cell or range of cells.

Knowledge Builder: Server and Client Configuration Guide gives full details of the Microsoft Excel Data Exchange Functions.

Microsoft Excel Data Exchange.....continued

Can't find MS Excel Data Exchange?

When MS Excel Data Exchange is installed it can only be used by the Windows NT user who installed it.

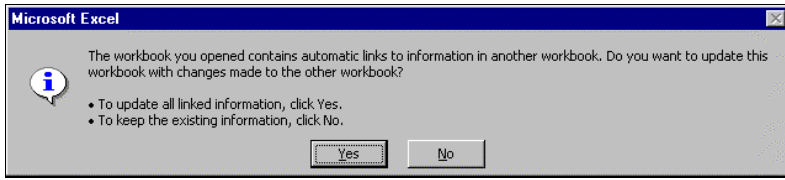
If you know that it is installed on the PC at which you are working, but there is no **Tools⇒MS Excel Data Exchange** menu item, follow this procedure:

Step	Action
1	Choose Tools⇒Add_Ins and click Browse .
2	Navigate to the file c:\Honeywell\client\xldataex\mede.xla and click OK .
3	If you get a prompt to replace an existing file of the same name choose Yes .
4	Click OK to complete your access to MS Excel Data Exchange.

Difficulty opening an existing file on another PC?

If a spreadsheet has been saved with “live” database links, that is the **Paste Values** option in the Wizard was left unchecked, the links will only work on the PC on which the spreadsheet was created.

If the spreadsheet is opened on another PC (on which the user has access to MS Excel Data Exchange) and the links fail follow this procedure:

Step	Action
1	Open the spreadsheet.
2	If the following message is displayed click No 
3	When the spreadsheet has opened choose: Tools⇒Microsoft Excel Data Exchange⇒ Update Formulas in Workbook

Lab Exercises – Microsoft Excel Data Exchange

Introduction

Proceed with the lab exercise listed below.

Ask your Course Manager for any assistance if you are not sure what you are expected to do.

Objectives

On successful completion of this exercise the student will be able to read point parameter values into a MS Excel spreadsheet.

Step	Action
1	Start MS Excel and open a new spreadsheet
2	Select cell A1 and choose Tools→Microsoft Excel Data Exchange→Wizard
3	Follow the process detailed earlier in this section to read the last 20, 5 second history values for LT101.PV, LT501.PIDA.PV, and SINEWAVE1.PV
4	Do not paste the values into the spreadsheet. This will enable them to be updated in real time.
5	Set the spreadsheet recalculation interval to 5 seconds.
6	Compare the data in the spreadsheet to the corresponding data in the server. What Station page will you view to do this?

OPC

Introduction

PlantScape provides both an OPC Client and an OPC Server.

The OPC Server makes PlantScape Server point data available for use in other applications.

The OPC Client is used to collect data from other OPC servers to put into PlantScape server point values

The PlantScape OPC Server and Client can be used together or with third-party OPC Servers and Clients.

What is OPC?

OPC stands for OLE (Object Linking and Embedding) for Process Control. It is a set of standards established by the OPC Foundation to foster greater interoperability between automation and/or control applications, field systems or devices and business or office applications in the process control industry.

This set of standards specifies the interface protocols to be observed by OPC clients and servers, based on the functional requirements of Microsoft's COM/OLE technology.

OPC is a mechanism for providing data from a data source and to communicate the data to any client application in a standard way. This relieves an application of the requirement to have specific knowledge about a particular data source, such as its internal structure and communications protocols.

Hence this eliminates the need to have different applications developed for different data sources.

An OPC server and an OPC client can reside on the same or different machines.

In the former case the server is known as a local server.

In the later case the server is known as a remote server.

OPC Groups and Items

Data is transferred between an OPC server and an OPC client in the form of "items".

An item represents a single element of data from the OPC server; for example, a PV.

The OPC client gathers items with the same deadband and update period into groups.

The OPC client requests the server to create these group(s) with the corresponding client-specified update rate(s) and deadband(s).

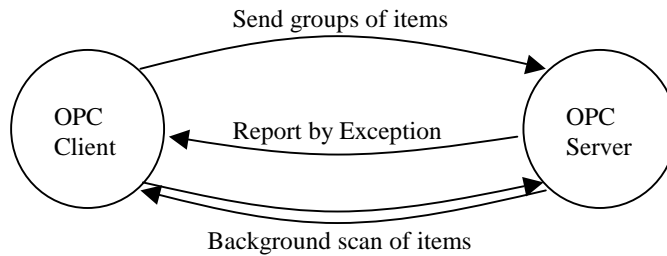
continued on next page

OPC.....continued

Report by Exception	The OPC server checks the current value of each item within a group at the group's period but only updates analog item values to the OPC client when they change by an amount equal to or greater than the group's deadband. Status item values are reported when they have changed state.
----------------------------	--

Background Scan	In addition to the report by exception mechanism the OPC client can perform a background scan of all the items in a group to update their values regardless of whether or not they have changed by an amount greater than the group's deadband.
------------------------	---

Schematic Diagram



PlantScape OPC Server

Introduction

The PlantScape OPC Server makes all PlantScape point parameters available to OPC clients.
The PlantScape OPC Server supports all mandatory OPC interfaces, including an automation interface for application development in Visual Basic.
For more information on the automation interface refer to the *OLE for Process Control Standard Version 1.0a*.

Setting up the PlantScape OPC Server for use with a Third Party OPC Client

All the necessary software for the PlantScape OPC Server is loaded when the PlantScape Server is installed if the system has an appropriate licence.

It is necessary to configure appropriate users on the OPC Server and Clients machines so that they will be able to communicate without being stopped by Windows NT security.

It is also necessary to install OPC Server Connect onto the OPC Client machine.

Step	Action
1	Create a user on the PlantScape Server with the same name and password as the user under which the OPC Client will be running. Make this user a member of the Users group.
2	<p>Open a Command Prompt on the PlantScape Server and run dcomcnfg</p> <p>Select the PlantScape OPC Server application and click Properties...</p> <p>Under the Security tab select Use custom access permissions and click Edit...</p> <p>Click Add⇒Show Users, choose the username you created in step 1 above, set the type of access to Allow access, and click Add⇒OK⇒OK.</p> <p>Select Use custom launch permissions and click Edit...</p> <p>Click Add⇒Show Users, choose the username you created in step 1 above, set the type of access to Allow launch, and click Add⇒OK⇒OK.</p> <p>Click OK to save these changes.</p>

continued on next page

PlantScape OPC Server.....continued

3	<p>On the machine with the OPC Client install the OPC Server Connect package from the PlantScape CD-ROM. This software tells the OPC client the details it need to know about the PlantScape OPC server.</p> <p>To do this run the command:</p> <p>\Server-Client\opcservconnect\setup.exe</p>
4	<p>On the machine with the OPC Client create a user with the name mngr and password mngr123. Make this user a member of the Users group.</p>

PlantScape OPC Interface

Introduction

The OPC Interface is an OPC client which supports communications to OPC servers that meet the specification of the *OLE for Process Control Standard version 1.0a*.
The OPC Interface supports both local and remote OPC servers.

Configuring the PlantScape OPC Interface

The PlantScape OPC Interface is configured in the same way as all the other PlantScape interfaces:
QuickBuilder is used to create Channel(s), Controller(s) and Point(s).

Step	Action
1	<p>If the OPC server is installed on a remote PC two users must be created:</p> <ul style="list-style-type: none">• on the PlantScape Server create a user with the same name and password as the user under which the OPC server will be running. Make this user a member of the Users group.• on the remote PC create a user with the name mngr and password mngr123. Make this user a member of the Users group. <p>If the OPC server is installed on the PlantScape Server then it would be simplest to run it under the mngr user account.</p>
2	<p>If the OPC server is installed on a remote PC you will need to load some software onto the PlantScape Server (that is, the OPC client) to provide it with details of the OPC server.</p> <p>Some OPC servers do not provide such software and the only solution is to load the full OPC server software onto the OPC client machine (that is, the Plant Scape Server).</p>

continued on next page

PlantScape OPC Interface.....continued

3

An OPC Channel is required for each OPC Server.
Before building the Channel you will need to know the OPC Server's Prog ID (available from the supplier of the OPC Server).

In Quick Builder create an OPC Channel with the following options as required:

The screenshot shows the 'Main' tab of the OPC Channel configuration window. The fields are as follows:

- Name: OPC_Chn_01
- Description: (empty)
- Marginal Alarm Limit: 25
- Fail Alarm Limit: 50
- Prog Id: (default)
- Background Scan Period: 60
- Diagnostic Scan Period: 60
- Host Name: opcserver
- Connect Timeout: 10 secs
- Read Timeout: 2 secs
- Item Type: OPC
- Last Modified: 15/07/1999 13:20:25
- Item Number: CHN01

Annotations:

- An arrow points from the text 'Prog ID is unique to each OPC server' to the Prog Id field.
- An arrow points from the text 'Hostname of the OPC Server machine in the PSc Server hosts file' to the Host Name field.

continued on next page

PlantScape OPC Interface.....continued

4

An OPC Controller is required for each Deadband value that will be used within an OPC Server.

A minimum number of Deadband values should be used to minimise the number of scan packets (used by the background scan only) that will be produced.

Create an OPC Controller with the following options as required:

The screenshot shows the 'Main' tab of the OPC Controller configuration window. The fields are as follows:

- Name: OPC_Cont_1
- Description: (empty)
- Channel Name: OPC_Chn_01 (dropdown)
- Marginal Alarm Limit: 25
- Fail Alarm Limit: 50
- Background Scan: Enabled (dropdown)
- Deadband: 0.500% (dropdown)

An arrow points from a text box 'Deadband used for Report by Exception' to the Deadband dropdown menu.

At the bottom, the status bar shows:

- Item Type: OPC
- Last Modified: 15/07/1999 13:21:42
- Item Number: RTU001

5

Create points in Quick Builder.

Parameters with the same scan period will be gathered into the same group of items.

The number of different scan periods used should be minimised in order to minimise the number of scan packets (used by the background scan only) that will be produced.

A maximum of 705 parameters can be configured for each Controller.

Network Node Interface

Overview

Attention

This option is included here for backward compatibility. Although supported by the current version of PlantScape Server the same functionality would be achieved better by using either Distributed Servers Architecture (preferred method) or OPC.

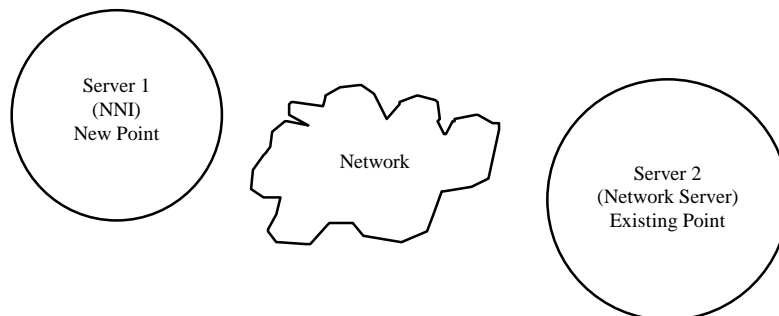
The Network Node Interface option allows the Server on which it is installed to access points in another Server as if that Server were a Non-Hybrid Controller.

The network is used as the Channel.

The interface is bi-directional but does not support the transfer of history or alphanumeric parameters.

How to implement Network Node Interface

The following steps are required to implement a new point in Server A accessing an existing point in Server B using Network Node Interface (refer to the diagram below):



Step	Action
1	Create an entry in the hosts file of the server in which the new point is to be created (Server 1) for the server whose database is to be accessed (Server 2).
2	Create a Network Node Channel in Server 1.
3	Create a Network Node Controller in Server 1.
4	Create the new point in Server 1 with Quick Builder using its online help for further details.
5	Note that the server will group a maximum of 100 parameters with the same scan period in a single scan packet.

Lab Exercises - Network Node Interface

Introduction

Proceed with the lab exercise listed below.
Ask your Course Manager for any assistance if you are not sure what you are expected to do.

Objectives

On successful completion of this exercise the student will be able to create a point in Server1 whose parameters have read and write access to a point in Server2.

Step	Action
1	You will be creating a point in Server1 which addresses a point in the Server2.
2	<p>Using Notepad open the hosts file of Server1.</p> <p>Add, or edit, the following entry....</p> <pre>a.b.c.d server2 server2#</pre> <div><p>Attention</p><p>Do not delete any entries for “server2#” where # does not equal your team number.</p></div>
3	Open your Quick Builder project file team#.qdb and add Network Node Channel Number 2# and Network Node Controller Number 2# addressing Server2#.
4	Create point NEW_LT10# which reads/writes its SP, PV, OP, and MD parameters from/to the point LT10# in Controller Number 2#.
5	Download the new items to Server1.
6	Check that the points NEW_LT10# (in Server1) and its pair LT10# (in Server2) follow each other as any parameter value is changed.
7	Note how complex this procedure is compared to configuring Distributed Servers Architecture (which also offers more features).