

PLANTSCAPE SERVER

DISPLAY BUILDING - 2

TABLE OF CONTENTS

Introduction	5
Review of Display Building.....	5
Scrollbars	6
Overview.....	6
Defining what to manipulate.....	6
Record Offset.....	7
Field Offset.....	7
File Offset.....	7
Point.Parameter.....	8
Database File.....	8
Database Link Definitions	9
Overview.....	9
File	9
Add File Offset	9
Record.....	10
Add Record Offset.....	10
Use separate records for each station.....	Error! Bookmark not defined.
A System Page Example	10
Example of Use separate records for each station	Error! Bookmark not defined.
Word	12
Add Field Offset	Error! Bookmark not defined.
Format.....	12
Read from oldest record of circular file	12
Repeats.....	13
Overview.....	13
Number	13
Spacing	13
Orientation	13
Increment	14
Acronyms.....	15
Introduction.....	15
Configuring User Acronyms.....	15
Acronyms with more than 10 characters.....	15
Using Acronyms	16
Using Acronyms from the Default File.....	16
Using Acronyms from a User Table	17
Building Customised Point and Group Detail Pages	18
Introduction.....	18
To Create a Point Detail page	18
To Create the Group Templates	18
Lab Exercises - Display Building with Database Links.....	19
Lab Exercise - Building custom Point Detail and Group Pages.....	21
Lab Exercise - VB Scripting	25

SESSION OBJECTIVES

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

- Configure scrollbars
- Describe, and demonstrate the use of, Record Offset and Field Offset
- Configure an explicit database address for a display object with an appropriate data format
- Configure repeats for a display object
- Configure a display object to have its value displayed by acronyms
- Create custom Point and Group Detail pages
- Create a VB Script to hide an object under specified conditions

REFERENCES

Display Builder Online Help

Knowledge Builder: Display Building Guide

Introduction

Review of Display Building

You should already be familiar with the issues relating to display file administration, named versus numbered pages, and shape sequences when building custom schematics.

This part of the course will cover how to integrate what you have learned in this course about the PlantScape Server database into custom schematics.

A number of more advanced concepts will be studied:

- Scrollbars
 - Record Offset
 - File Offset
 - Field Offset
 - Database references
 - Repeats
 - Acronyms
 - Customised Point and Group Detail pages
 - Further VB Scripting
-

Scrollbars

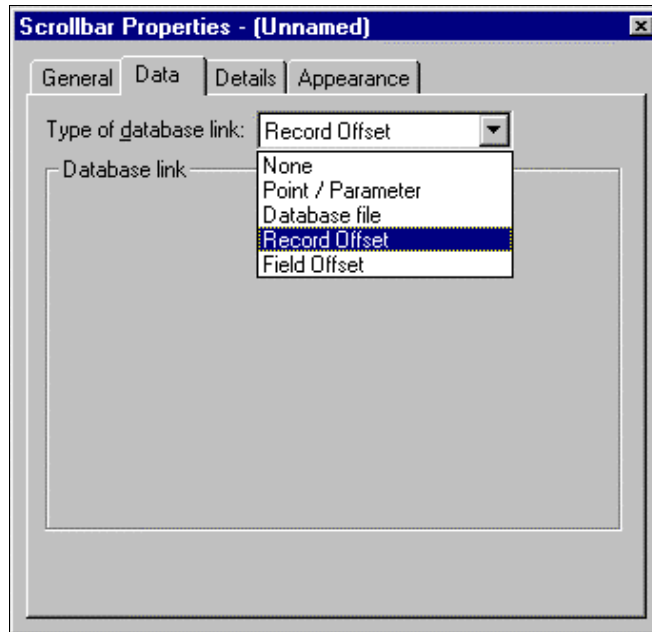
Overview

The addition of scrollbars to a schematic can greatly enhance its flexibility.

Scrollbars allow an operator to scroll a single, or small number, of displayed data fields through a much larger number stored in the server database.

There are many examples in use in standard system pages, for example, the Channel Status Summary scrolls a display of 20 Channels through a list of many more possible Channels.

Defining what to manipulate



A scrollbar manipulates a single variable in the Server database. Using the Scrollbar Properties this variable can be configured to be:

- A Point/Parameter, or
- A value in a Database file, or
- Record Offset of the Station displaying the page that includes this scrollbar, or
- Field Offset of the Station displaying the page that includes this scrollbar.

Continued on next page

Scrollbars.....continued

Record Offset

Each station has a parameter in the database called the “record offset” the use of which will be described later. Its location is:

F: 2 R: n W: 253 Format: Integer4
where n is the station number.

(Check this with the results of the Database Exercise in the Database Structure Section.)

Generally the “record offset” is reset to 1 when the station displays a new page.

Field Offset

Each station has a parameter in the database called the “field offset” the use of which will be described later. Its location is:

F: 2 R: n W: 255 Format: Integer4
where n is the station number.

(Check this with the results of the Database Exercise in the Database Structure Section.)

Generally the “field offset” is reset to 1 when the station displays a new page.

File Offset

This option is not directly selectable but this description is included here for completeness.

Each station has a parameter in the database called the “current file offset” the use of which will be described later. Its location is:

F: 2 R: n W: 251 Format: Integer4
where n is the station number.

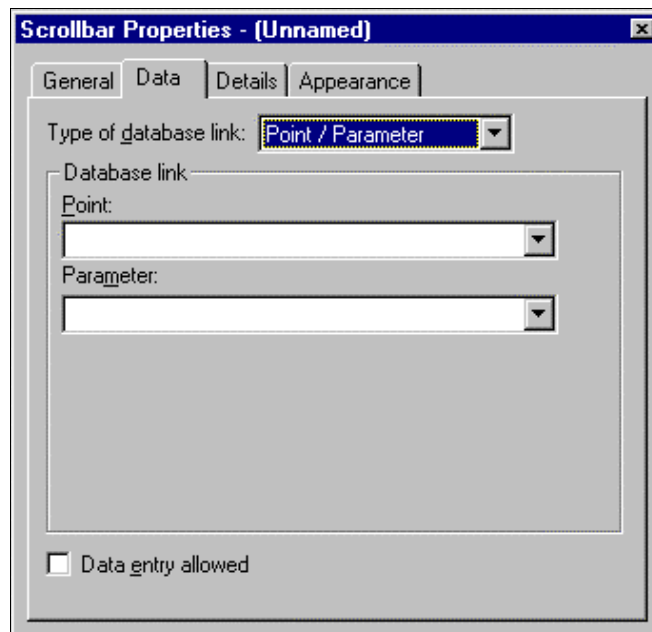
(Check this with the results of the Database Exercise in the Database Structure Section.)

Generally the “file offset” is reset to 1 when the station displays a new page.

Continued on next page

Scrollbars.....continued

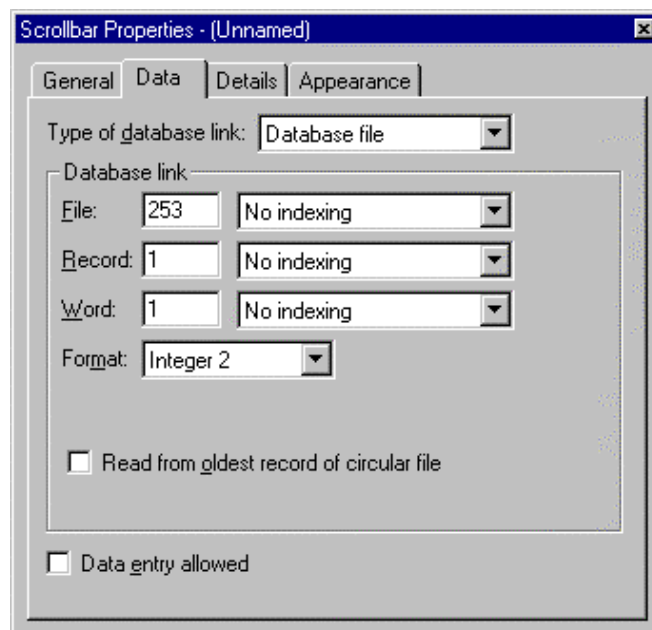
Point.Parameter



If the Point/Parameter link is selected then a specific Point ID and Parameter can be defined to be the manipulated variable of the scrollbar.

For example, the scrollbar could be used to scroll a SP to any value in its range.

Database File



If the Database File link is selected any database location (logical file) can be defined to be the manipulated variable of the scrollbar.

The following explains how the Database Link fields are defined.

Database Link Definitions

Overview

When the Database File link type is chosen for an object (for example, a scrollbar or an alphanumeric) the following Properties need to be defined:



File

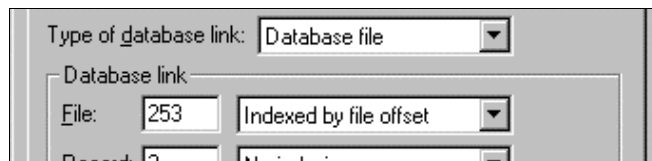
Number, between 1 and 400, of the logical file where the required data is stored.

Attention

User Table (n) = File Number ($250 + n$)
where $1 \leq n \leq 150$

Indexed by File Offset

If the File number is “Indexed by file offset” then the actual file number referenced =
the number stored in the “file offset” for the station displaying this schematic + the File Number defined above -1.



For example,
if File Number = 253,
and File Offset = 3,
then the referenced file number = $253 + 3 - 1 = 255$.

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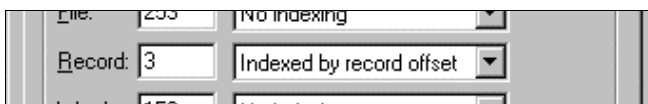
Database Link Definitions.....continued

Record

Record Number where the required data is stored.

Indexed by Record Offset

If the Record number is “Indexed by record offset” then the actual record number referenced =
the number stored in the “record offset” for the station displaying this schematic + the Record Number defined above -1.

A screenshot of a software interface for defining database links. It features several input fields and dropdown menus. The 'Record' field is set to '3'. The 'Indexed by' dropdown menu is set to 'Indexed by record offset'. Other visible fields include 'File' (set to '255'), 'Word' (set to '150'), and 'No indexing' (set to 'No indexing').

For example,

if Record Number = 3,

and Record Offset = 5,

then the referenced record number = $3 + 5 - 1 = 7$.

Indexed by Station Number

A screenshot of a software interface for defining database links. It features several input fields and dropdown menus. The 'Record' field is set to '3'. The 'Indexed by' dropdown menu is set to 'Indexed by Station no.'. Other visible fields include 'File' (set to '255'), 'Word' (set to '150'), and 'No indexing' (set to 'No indexing').

If the Record number is “Indexed by Station Number” then the total number of records in the defined File are divided equally among the maximum possible number of Stations (41, note that one of these is not user accessible).

The resulting effect is for each Station to be limited to accessing only its own set of records within the file.

This feature is only used when addressing records in File Number 2 (CRTTBL_F) or in custom applications where multiple records per Station have been configured in User Tables.

As an example, if this feature is enabled when addressing logical file CRTTBL_F (see the following paragraph and the diagrams on next page) then the effect is to label every record as number 1 for its corresponding Station.

A System Page Example

This feature is used on many system pages so that a particular page can be viewed simultaneously, and scrolled independantly, at multiple Stations.

Open c:\honeywell\client\system\xxx\sys065.dsp and view the properties of the leftmost alphanumeric object as an example.

Continued on next page

Database Link Definitions.....continued

Example with Record Number not indexed With the Record number not indexed, the address F:2 R:1 W:*m* would point to the field shaded below regardless of the Station which was displaying the page holding the reference.

CRTTBL_F

Word	1	2	-----	<i>m</i>	-----
Record 1					
Record 2					
Record 3					
:					
:					
:					
Record 41					

Example with Record number “Indexed by Station Number” With the Record number “Indexed by Station Number”, the address F:2 R:1 W:*m* would point to the field shaded below if the address was generated from Station number 3.
The effect is to relabel each record as record number 1 for each of the Station numbers 1 to 41.

CRTTBL_F

	Word	1	2	-----	<i>m</i>	-----
Station 1	Record 1					
Station 2	Record 1					
Station 3	Record 1					
:	:					
:	:					
:	:					
Station 41	Record 1					

continued on next page

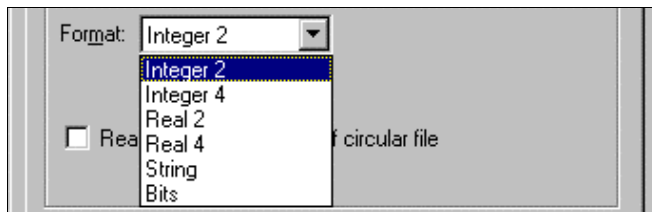
Database Link Definitions.....continued

Word	Number of the word where the required data is stored, or the first word of a series of words where the required data is stored.
Indexed by field offset	If the word number is “Indexed by field offset” then the actual word referenced = the number stored in the “field offset” for the Station displaying this schematic + the Word Number defined above -1.



For example,
if Word Number = 150,
and Field Offset = 17,
then the referenced Word number = $150 + 17 - 1 = 166$.

Format	Choose the format of the data stored at the referenced location.
---------------	--



Integer2	Integer in 1 word (2 bytes)
Integer4	Integer in 2 words (4 bytes)
Real2	IEEE FP number in 2 words (4 bytes)
Real4	IEEE FP number in 4 words (8 bytes)
String	ASCII characters, 2 per word (1 byte each)
Bits	Integer value of a contiguous series of bits

If the format defined here does not match the format of data already stored in the referenced location then the resulting data displayed will be indeterminate.

Read from oldest record of circular file	Normally this checkbox is not checked and circular files are read backwards from their most recent record.
---	--

With this checkbox checked circular files are read forwards from their oldest record.

Repeats

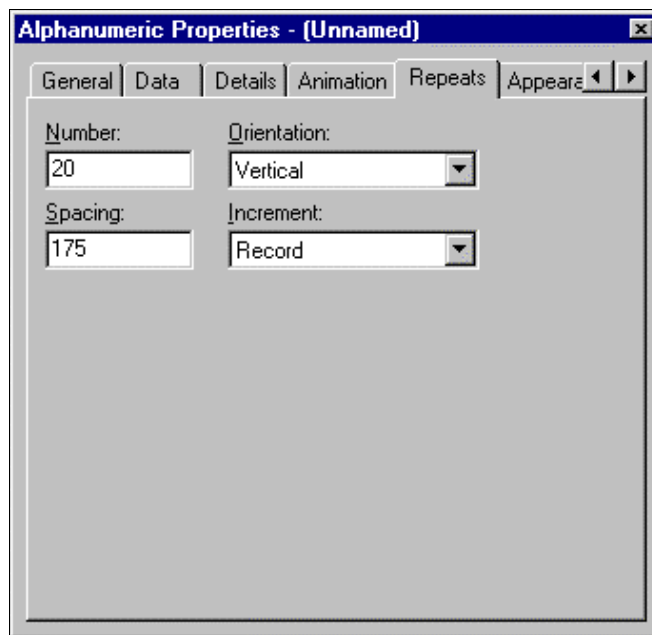
Overview

On some displays it might be required to display multiple items of data which are in consecutive locations in the database. Rather than creating separate objects for each row or column, an object can be repeated automatically by using the **Repeats** tab of the Properties dialog box.

Attention

Set the object to the desired size before setting the number of repeats > 1.

Parameters to be defined are:



Number

Number of times the object is to be repeated on the schematic

Spacing

The spacing between repeated objects can be changed by clicking on the grouped repeated objects and dragging the outline to resize it.

The value in “Spacing” enables a specific spacing to be set.

The spacing between repeated objects is defined in “logical units”. A schematic page is 8000 “logical units” wide and 4500 “logical units” high.

Orientation

Selecting **Horizontal** displays the repeats left to right, Selecting **Vertical** displays the repeats top to bottom

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Repeats.....continued

Increment

Defines what database parameter will be incremented to obtain the data for each successive repeated object.

Point ID	Each successive repeat will use the successive Point ID (based on Point Reference Number). Intended for internal Honeywell use only.
Parameter	Each successive repeat will use the successive Point parameter (based on Parameter Reference Number). Intended for internal Honeywell use only.
History Offset	Each successive repeat will use the successive history value
File	Each successive repeat will use the successive file number
Record	Each successive repeat will use the successive record number
Field	Each successive repeat will use the successive data field
Value	Each successive repeat will display the value stored at the object's database address plus its sequence number. This is typically used to number the rows of a table. Under the Properties Data tab set File=2, Record=1, Word=253, Format=Integer4 Check "Add Record Offset" and "Use separate records for each Station". Open c:\honeywell\client\system\rnnn\sys065.dsp and view the properties of the leftmost alphanumeric object as an example.
Push-buttons	Each successive pushbutton will increment the selected task request parameter; 1, 2, 3, or 4.

Acronyms

Introduction

Acronyms are text strings that are used to represent the value of an alphanumeric object, which in turn represents either a status point parameter or an integer value.

For instance, the list of Report types which is available from the **Type** combobox on a Report Definition page is a sequence of acronyms.

A default acronym file is supplied with the PlantScape Server database.

Each acronym in the default acronym file is a maximum of 10 characters long (including spaces and any other punctuation marks).

There are 3 sets of acronyms available within the default file:

- System
- TDC CL (used only in conjunction with TDC 3000 CL programs)
- User

Only the User set should be customised.

Configuring User Acronyms

The User Acronyms Configuration page is accessed by choosing

Configure→Acronyms→User

Scroll through the list until you find a series of blank records.

Enter your required acronyms in contiguous records in the correct order

Acronyms with more than 10 characters

It is possible to create custom acronym tables for use where more than 10 characters are required.

This requires User Tables to be configured and the process is described in

Knowledge Builder: Display Builder→

Defining Display Object Details→Using Acronyms

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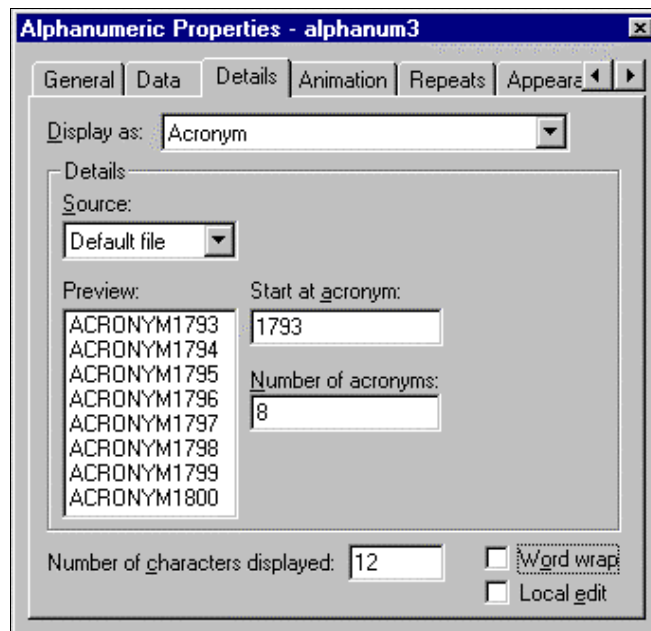
Acronyms.....continued

Using Acronyms

When a status parameter is displayed with a combobox or alphanumeric object the text choices offered to the Station Operator can be either:

- the state descriptors of the point, or
- an acronym sequence.

To use an acronym sequence select the **Details** tab in the Properties dialog box and choose to **Display as: Acronym**



Using Acronyms from the Default File

To use acronyms from the default file set the **Source** to Default file.

Enter the number of the first acronym of the desired sequence in the **Start at acronym** field.

Enter the number of contiguous acronyms you require in the **Number of Acronyms** field.

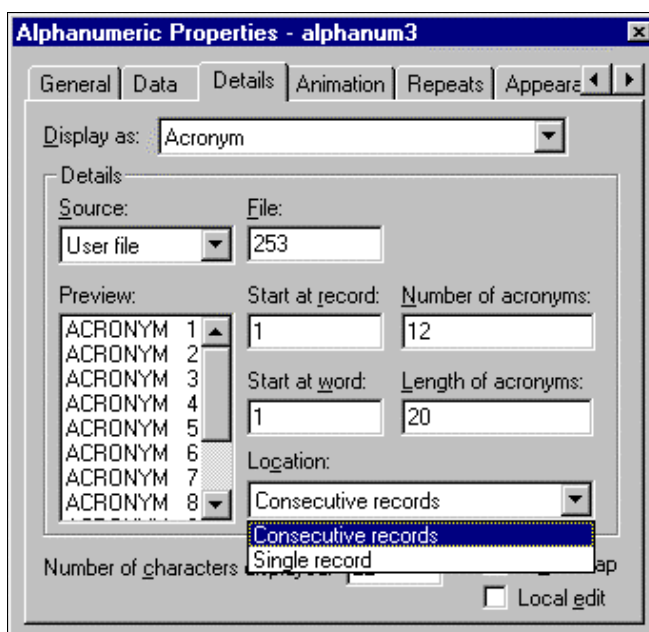
If Display Builder is being run on the Server pressing <Tab> will display the selected acronyms under **Preview**.

If Display Builder is being run on a remote PC the selected acronyms cannot be displayed.

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Acronyms.....continued

Using Acronyms from a User Table



To use acronyms that have been previously configured in a User Table set the **Source** to User file and set **File** to the file number of the User Table.

If the User Table has been configured to hold one acronym per record set the **Start at record** field to the record number of the first record of the desired acronym sequence, set the **Start at word** field to 1, and set the **Location** to Consecutive records.

If the User Table has been configured to hold all the acronyms in one record set the **Start at record** field to 1, set the **Start at word** field to the number of the first word of the desired acronym sequence and set the **Location** to Single record.

Enter the number of contiguous acronyms you require in the **Number of Acronyms** field.

Enter the number of characters used in the acronyms in the **Length of acronyms** field.

If Display Builder is being run on the Server pressing <Tab> will display the selected acronyms under **Preview**.

If Display Builder is being run on a remote PC the selected acronyms cannot be displayed.

Building Customised Point and Group Detail Pages

Introduction

PlantScape allows the specification of custom built pages which can be used as the point detail and group faceplate templates for that point.

To specify which custom page is to be used for any point enter the following:

- For Hybrid Controller points complete the **Point Detail Page** and **Group Detail Page** fields of the **Server** tab in Control Builder for that point.
 - For Non Hybrid Controller points complete the **Point Detail Display** and **Group Faceplate Template Display** fields of the **Display** tab in Quick Builder for that point.
-

To Create a Point Detail page

Open a new page in Display Builder.

Click the **Properties Window** tool and in the Display Properties set the page **Type** to **Point Detail**.

Draw the required objects on the page, leaving the **Point ID** blank wherever a point reference is entered.

To Create the Group Templates

Open an existing Group Template page (their names are similar to c:\honeywell\client\system\rnnn\sysDtl???Group.dsp).

Without altering the overall page layout draw the required objects leaving the Point ID blank wherever a point reference is entered. Only draw dynamic elements.

If any static elements (for example, text) are required on the faceplate, build this static element as a shape sequence as follows:

- create the required static elements as a numbered shape,
- choose **Edit→Insert Shapelink...**, select the shape file and click **Insert**, position the shape on the group faceplate you are building
- right click on the shape and choose **Properties**, under the **Data** tab set the **Type of database link** to **Point/Parameter**, leave the **Point** blank, and set the **Parameter** to **ALMSTS**.

Attention

To minimise the initial display time of the Group page group all the static elements required for a single faceplate into a single numbered shape.

Lab Exercises - Display Building with Database Links

Introduction

For simplification it is recommended that you use named pages and save them in the \\server1\honeywel\client\abstract directory.

Set your station's custom display path to
\\server1\honeywel\client\abstract

Database Reference

The objective of this exercise is to demonstrate the use of database links.

Step	Action
1	Create a schematic with the following details: <ul style="list-style-type: none">Title: Team# Project DisplayFile name: team#.dsp (a named page)Word 1 of the first 2 records of User Table 1# What data is in these locations? How are the fields formatted?
2	Enter the other team member's initials into the first word of record 2 of User Table 1#. Confirm this has been successful by using the utility fileio .

Acronyms

The objective of this exercise is to demonstrate the definition and application of User Acronyms.

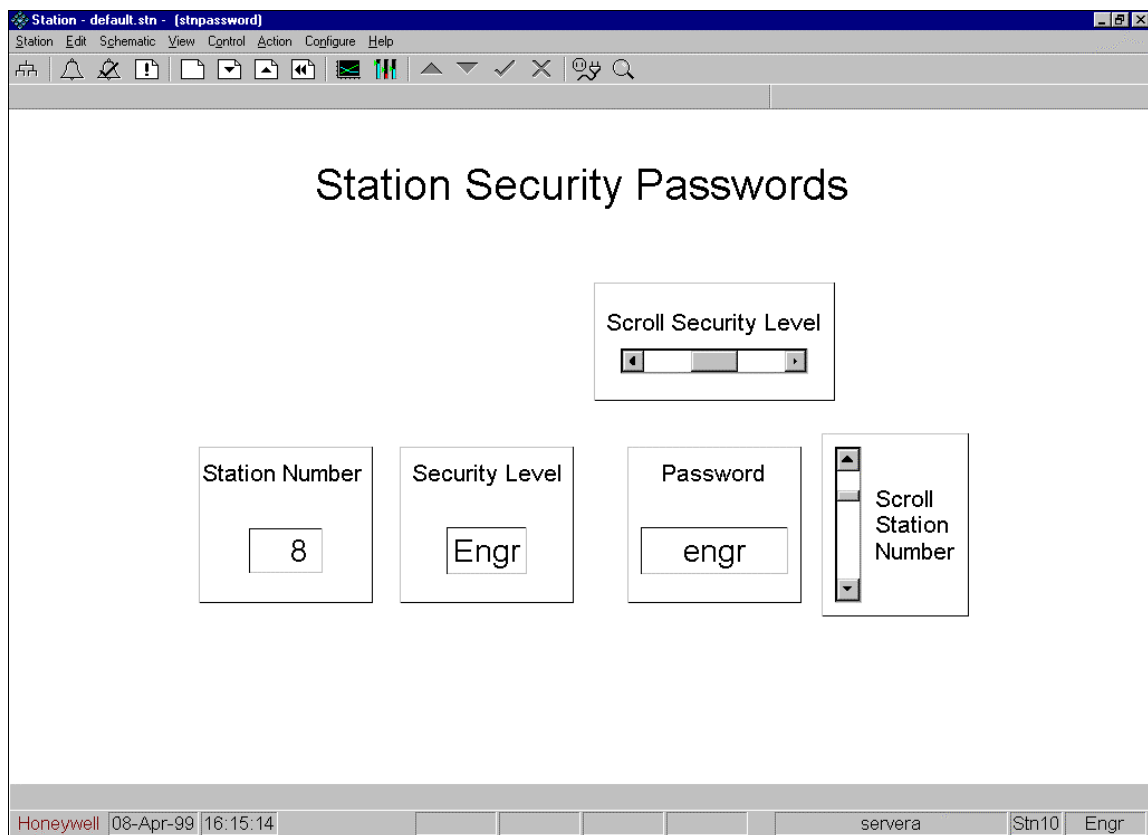
Step	Action
1	Add the Acronyms STOPPED and STARTED as follows: Team 1: 3001, 3002 Team 2: 3003, 3004 Team 3: 3005, 3006 Team 4: 3007, 3008 Team 5: 3009, 3010 Team 6: 3011, 3012
2	Add the PV (alphanumeric) and OP (combobox) parameters of the Point VLV110# to your schematic. Show the state using the acronyms you have just configured.
3	Switch the OP of VLV110# to verify correct operation.

Lab Exercises - Advanced Display Building.....continued

Scrollbars

The objective of this exercise is to demonstrate the correct use and definition of scrollbars and database links.

Step	Action
1	<p>Add the objects illustrated below to your schematic where:</p> <ul style="list-style-type: none">The horizontal scrollbar scrolls the Security Access Level. You will need to read this as an integer value and display it using the appropriate System Acronyms.The vertical scrollbar scrolls the station number, 1 to 40. <p>Allow the user to change passwords only when they have Mngr access level.</p> <p>Change one of the passwords for your station and test it.</p> <div>Attention The passwords are case sensitive</div>



Lab Exercise - Building custom Point Detail and Group Pages

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.

Point Detail Page

This exercise will demonstrate how to create a custom Point Detail page, primarily to match a custom Control Module type that has been created in a Hybrid Controller, or a non-standard analog, status or accumulator point created in Quick Builder.

Step	Action
1	<p>Start Display Builder by choosing:</p> <p>Start→Programs→Plantscape Server→ Display Builder</p> <p>Choose File→Open and select the path:</p> <p>c:\honeywell\client\system\rnnn</p> <p>Choose a filename sysdtl*.dsp that most closely resembles your Control Module, or point, type; for example:</p> <p>sysdtlpida.dsp for a PID control module, or:</p> <p>sysdtldevctla.dsp for a device control module, or:</p> <p>sysdtlana.dsp for an analog point</p>
2	<p>Open the Display properties, enter the following data:</p> <p>Title: Team# Custom Detail</p> <p>Numbered page: unchecked</p> <p>Page Type: Point Detail</p> <p>and click OK</p>
3	<p>Choose File→Save As , change the directory to:</p> <p>c:\honeywell\client\abstract</p> <p>and enter a filename:</p> <p>sysdtlxxxx.dsp</p> <p>where xxxx is unique and appropriate for your Control Module, or Point, type.</p>

continued on next page

Lab Exercise - Building custom Point Detail and Group Pages... ...continued

Point Detail Page

.....continued

4	<p>Edit the page to suit your requirements, saving any changes as you go.</p> <p>When editing the details of animated objects leave the Point ID field blank and enter only the parameter name.</p> <p>The Point ID will be supplied by the Server whenever a Point Detail is requested for a point using this display file.</p>
5	<p>When you have finished the page copy it to:</p> <p>\\server1\honeywel\client\abstract</p>
6	<p>Using either Quick Builder or Control Builder, assign this Point Detail page to the appropriate Control Module(s) or point(s).</p>
7	<p>From Station display the Detail page for the Point(s) and check that all the parameters are displayed correctly.</p>

Lab Exercise - Building custom Point Detail and Group Pages... ...continued

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.

Group Pages

This exercise will demonstrate how to create custom Group pages, primarily to match a custom Control Module type that has been created in a Hybrid Controller, or a non-standard analog, status or accumulator point created in Quick Builder.

Step	Action
1	<p>Start Display Builder by choosing:</p> <p>Start→Programs→Plantscape Server→ Display Builder</p> <p>Choose File→Open and select the path:</p> <p>c:\honeywell\client\system\rnnn</p> <p>Choose a filename sysgrp*.dsp that most closely resembles your Control Module type; for example:</p> <p>sysgrppida.dsp for a PID control module, or:</p> <p>sysgrpdevctla.dsp for a device control module, or:</p> <p>sysdtlanagroup.dsp for an analog point</p>
2	<p>Choose Edit→Page Details and enter</p> <p>Title: Team# Custom Detail</p> <p>Numbered page: unchecked</p> <p>Page Type: Standard</p> <p>and click OK</p>
3	<p>Choose File→Save As , change the directory to:</p> <p>c:\honeywell\client\abstract</p> <p>and enter a filename:</p> <p>sysgrpxxxx.dsp</p> <p>where xxxx is unique and appropriate for your Control Module, or Point, type.</p>

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Lab Exercise - Building custom Point Detail and Group Pages... ...continued

Group Pages

.....continued

4	<p>There are three templates on this page: one for the Group Detail, one for the Group Trend, and one for the Group Numeric History</p> <div data-bbox="735 470 1321 651" style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Attention</p> <p>It is essential that their overall size and position remain undisturbed so that the resulting Group pages display correctly.</p> </div> <p>Edit the templates to suit your requirements, saving any changes as you go. Ensure that the guidelines on page 18 are adhered to.</p> <p>When editing the details of animated objects leave the Point ID field blank and enter only the parameter name.</p> <p>The Point ID will be supplied by the server whenever a Point Detail is requested for a point using this display file.</p>
5	<p>When you have finished the page copy it to</p> <p>\\server1\honeywel\client\system\rnnn</p>
6	<p>Using either Quick Builder or Control Builder, assign this Point Detail page to the appropriate Control Module(s) or point(s).</p>
7	<p>Display a Group Detail page that includes one of the Points and check that all the parameters are displayed correctly.</p> <p>Also check the Group Trend and the Group Numeric History.</p>

Lab Exercise - VB Scripting

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.

Objective

The objective of this exercise is to create a VB Script that will hide the passwords unless the Station, or Operator, has an access level that is equal to, or greater, than that of the password currently being displayed.

Step	Action
1	Open file team#.dsp with Display Builder.
2	<p>Study the definition file for CRTTBL_F and locate the data that defines the station's current access level.</p> <p>Add an alphanumeric object to monitor this database reference.</p>
3	<p>Create a script to allow the user to view and change only those passwords associated with security levels equal to or lower than his/her own.</p> <div><p>Hint</p><p>You will need to use the "OnUpdate" event.</p></div>