# Table of Contents

1. **Introduction / About This Guide** .................................................................................. 5
   - Installing and Administering Smartware Studio ................................................................. 5
   - To Learn More about Smartware Studio ............................................................................. 5
   - To Contact Us ...................................................................................................................... 5

2. **Creating a New Estimate** ............................................................................................... 7
   - Inserting a Shortcut to an Estimate in Another Project ....................................................... 7

3. **Building the Estimate Structure** .................................................................................... 9
   - Types of Estimating Nodes ................................................................................................. 9
     - The Estimate Node ........................................................................................................... 9
     - Area Nodes ..................................................................................................................... 9
     - System Nodes ................................................................................................................. 10
   - Working with the Estimating Structure Nodes .................................................................. 10
     - Moving and Copying Nodes ......................................................................................... 10
     - Storing Files with Nodes .............................................................................................. 11
     - Adding Notes to Nodes .................................................................................................. 11
     - Temporarily Excluding Areas and Systems .................................................................. 11

4. **Estimating a System** ................................................................................................... 13
   - Material, Points and Labor ............................................................................................... 13
   - The Parts Tab ..................................................................................................................... 13
     - The Parts Browser ......................................................................................................... 14
     - The System’s Part List .................................................................................................... 15
     - Adding a Custom One-Time Part ................................................................................. 15
     - Adding Parts to the User Parts Database ................................................................... 16
     - Submitting User Parts for Approval in the Main Parts Database ............................... 17
     - Part Packages ................................................................................................................. 18
   - The Points Tab ................................................................................................................ 18
     - Adding Points to a System ............................................................................................ 19
     - Point Labor Settings ..................................................................................................... 21
   - The Labor Tab ................................................................................................................ 22
     - Labor Settings ............................................................................................................... 23
   - Typical Systems ............................................................................................................... 24
     - Setting the Typical Of Value for a System .................................................................. 24
     - Not Typical Items ......................................................................................................... 24
     - Repetition Curves .......................................................................................................... 24
5. THE ESTIMATE SUMMARY TABS ................................................................. 27
   Selecting the Estimate Node ........................................................................ 27
   The Overview Tab ........................................................................................ 27
   The Material Tab .......................................................................................... 28
   Cost Escalations (for Long Term Projects) .................................................... 28
   Assign Material to a Subcontract .................................................................. 29
   Update Parts to Database ............................................................................. 29
   The Points Tab .............................................................................................. 31
   The Labor Tab ............................................................................................... 32
   Global Labor Adjustments ............................................................................ 32
   Cost Escalations (for Long Term Projects) .................................................... 34
   The Subcontracts Tab .................................................................................... 35
   Creating Subcontracts for Labor Codes ......................................................... 35
   Reviewing and Updating the Subcontract List ............................................... 36
   The Expenses Tab .......................................................................................... 38
   Travel Expenses ........................................................................................... 38
   Taxes and Freight .......................................................................................... 40
   Allowances ..................................................................................................... 41
   Other Expenses ............................................................................................ 42
   The Summary Tab .......................................................................................... 42
   Calculating the Contract Amount .................................................................. 44

6. REPORTS ....................................................................................................... 45
   Generating Reports ........................................................................................ 46
   Creating Custom Reports ............................................................................. 46
   Distributing Custom Reports to Other Users ................................................ 47

7. THE ESTIMATE MODEL AND TEMPLATES ............................................. 49
   Accessing the Estimate Model ....................................................................... 49
   The Estimate Model Parameters ................................................................... 50
   Global Labor Adjustments ............................................................................ 50
   Building Types Table .................................................................................... 51
   Building Height Table .................................................................................... 52
   Additional Adjustments .................................................................................. 53
   Expenses and Allowances ............................................................................. 54
   Estimate Model Templates ............................................................................. 54
   Loading Specific Model Elements into an Estimate ....................................... 55
   Sharing Estimate Model Templates ............................................................... 56

8. WORKING WITH OTHER APPLICATIONS .......................................... 57
   Importing from Concerto Suite (SOCC) ......................................................... 57
   Importing from Designer Suite ..................................................................... 58
   Using Prometheus ........................................................................................... 59
1. Introduction / About This Guide

This Guide will describe the features and functionality of the Smartware Studio Estimating Module.

Installing and Administering Smartware Studio
For complete details on how to install, setup and configure Smartware Studio refer to the separate *Smartware Studio Setup and Administration Guide*. Specific Chapters of note include:

- *Configuring a Smartware Studio Workstation* (PDF Files and PDF Generator)
- *The Parts Database Manager*

To Learn More about Smartware Studio
Many of the topics covered in this Guide are better illustrated through visual examples. To that end, our video training sessions are available for viewing and downloading from our web site. We encourage you to use these videos as part of your training.

This guide also assumes a certain amount of familiarity with the basic concepts of Smartware Studio. For more information about using Smartware Studio projects, refer to the separate *Smartware Studio User’s Guide*.

To Contact Us
Our technical support team is available weekdays from 8 am to 5 pm Eastern time at (716) 213-2222. You may also visit our web site at [http://www.smartwaretech.com](http://www.smartwaretech.com) or e-mail us at techsupport@smartwaretech.com.
2. Creating a New Estimate

An Estimate is a separate project. To associate it with a Customer Site or Job, you can insert a shortcut to it in the parent project after the Estimate has been created.

To create a new Estimate:

- Select **FILE**→**NEW PROJECT** to bring up the Open Project dialog.
- Click the **NEW PROJECT**… button.
- In the **PROJECT TYPE** list, select *Estimate*:

![New Project Dialog]

- Specify a **PROJECT NAME** and (optionally) a **QUOTE NUMBER**.
- Click the **CREATE** button.

**Inserting a Shortcut to an Estimate in Another Project**

To associate an Estimate with a Customer Site or Job project:

- Create the Estimate and Upload it to the Server (you cannot create shortcuts to local projects).
- Open the Parent (Customer Site or Job) Project and check it out.
- Select the node to which you want to add the shortcut.
- Right-click on the node and select **ADD**→**ESTIMATING**→**SHORTCUT TO ESTIMATE**.
- Select the Estimate project from the list and click OK.

When you double-click the shortcut in the Parent Project’s tree, a new instance of Smartware Studio will start and the Estimate will be opened.
3. Building the Estimate Structure

The information in an Estimate is stored in the project tree as a top-level Estimate Node, with a set of Area and Systems nodes below it.

![Diagram of Estimate Structure]

**Types of Estimating Nodes**

There are three types of nodes relevant to Estimating: The Estimate node, Area nodes and System nodes.

*The Estimate Node*

The top node of the tree is the Estimate Node. The tabs available from this node provide summaries of all the elements of the estimate as well as access to the estimate reports.

The Estimate tabs are described in detail in a later chapter.

*Area Nodes*

While the System nodes represent the heart of the estimate, the Area nodes are used to logically group and organize the Systems.

- You can create as many Areas as you want.
- You can create Areas beneath other Areas to build a tree structure.
To add an Area to the Estimate or another Area:

- Select the Estimate or the existing Area node and click the ADD AREA icon (;left) in the Estimating Toolbar; or
- Right-click the Estimate or the existing Area and select the ADD  ESTIMATING  AREA menu item; or
- Open the Estimating stencil in the Toolbox and drag an Area node onto the Estimate or another Area node.

**System Nodes**

A System node represents a self-contained unit of the estimate, usually a single system in the project (such as a Chiller or Air Handling Unit). For each system, you can add the detail that makes up the estimate: Material, Points and Labor.

To add a System to an Area or the Estimate:

- Select the Area or Estimate node and click the Add System icon (left) in the Estimating Toolbar; or
- Right-click the Area or Estimate node and select the ADD  ESTIMATING  SYSTEM menu item; or
- Open the Estimating stencil in the Toolbox and drag a System node onto the Area or Estimate node.

Systems are described in more detail in the later chapter Estimating a System.

**Working with the Estimating Structure Nodes**

As with all nodes in the Smartware Studio trees, there are many ways to move and manipulate them and store information.

**Moving and Copying Nodes**

- You can move a node around the tree by simply dragging it onto another node.
- If you right-click a node and bring up its menu, you will find commands to COPY and PASTE nodes, as well as DUPLICATE, DUPLICATE X (Create X copies at one time), DELETE and RENAME.
Storing Files with Nodes
Aside from the estimating data (material, points and labor), you can store any number or types of files on any node.

- Select a node in the tree and click on the Files tab in the right pane.
- Drag and Drop or Copy and Paste files from other nodes, other projects or Windows in the same way as you would in Windows Explorer.

Adding Notes to Nodes
You can add notes with any node by selecting the Comments tab.

Temporarily Excluding Areas and Systems
Areas and Systems can be marked as "excluded" from the Estimate. This allows you to consider various alternatives or to temporarily remove a portion of the estimate without deleting it permanently.

- To exclude an Area or System, right-click on the node and select the Tools → Estimating → Exclude from Estimate menu item.
- To re-include the Area or System, select Tools → Estimating → Include in Estimate.
- If an Area is excluded, all Systems in that Area are also excluded implicitly.
- An excluded Area or System will appear in the tree with a red circled line through it and the word "EXCLUDED."
4. Estimating a System

The heart of the Estimate is the underlying information for each System.

Material, Points and Labor

The cost of a System is based on three types of data:

- A list of the individual *Parts* that make up the Material list. Each part can add a cost in dollars as well as a number of labor hours.
- A count or list of control *Points*, each of which can add labor hours.
- *Labor* hours specified explicitly as well as calculated from the Parts and Points.

These items can be viewed on the appropriate tabs when a System is selected.

The Parts Tab

When you select the Parts tab for a System, the screen is broken into two regions:
Estimating a System

As seen in this screen:

- The top region shows a list of the parts that have already been added to the System.
- The bottom region is the Parts Browser, which shows a list of all the available parts in the Parts Database and helps you find what you need.
- You can adjust the size of the two regions by dragging and moving the splitter bar between them.

**The Parts Browser**

The Parts Browser contains a number of features to help locate parts:

- You can sort by any column by clicking on the column heading.
- If you select a MANUFACTURER, the list will show only the parts from that manufacturer.
- If you begin to type into the PART NUMBER box, the list will scroll to the parts beginning with those letters.
- If you enter one or more keywords (separated by spaces) into the KEYWORDS box, the list will be filtered to only those that include all the keywords in either the Part Number or Description columns.
- If you check the SHOW ONLY TOP PARTS checkbox, only those marked as Top Parts by your company's Database Administrator will be shown.
- The PARTS IN THIS ESTIMATE is a tab shows a quick view of all the part numbers in use in the current Estimate.

If a PDF file is specified in the database, the PDF icons at the bottom will highlight. You can then view the PDF by clicking on the icon. Refer to the Smartware Studio Setup and Administration Guide for more information on installing PDF files.
To add a part from the Part Browser to the System's Part List, double-click it in the Part Browser's list or select it and click the ADD PART TO SYSTEM button.

**The System's Part List**

Once parts have been added to the System, they appear in the System's Parts List in the top region:

- The columns with a gray background are read only. The columns with a white background are editable.
- The labor hours (per part) are shown in the columns to the right with a blue background.
- The BOM column indicates whether the part should be shown on a Bill of Materials.
- The Not Typical checkbox, if checked, indicates that the part's quantity should not be multiplied by the System's Typical Of value.
- To delete a part, click the DEL button.
- To duplicate a part, right-click on the row and select COPY PART. You can then right-click in the background of the Part List in the same system or a different system and select PASTE PART.

**Adding a Custom One-Time Part**

To add a part to the Part List that isn’t in the Parts Database, you can choose one of two methods:

- Add a Part Line Item
- Add a Part to your User Part Database (see following sub-section)
To add a Part Line Item:

- Click the **ADD LINE ITEM** button at the bottom of a system’s Part List

- Complete the appropriate fields. The part will be added to the system’s part list.

### Adding Parts to the User Parts Database

If there is a part that is not in your company’s parts database but you expect to use it frequently, you can start by adding it to your own User Parts Database. These parts are stored on your workstation, and are available to use in the same way as the regular parts.

- To select or create User Parts, select the **MY PARTS** tab when a system is selected.
- You can also view your User Parts by selecting **TOOLS** → **MANAGE MY PARTS** from the main Smartware Studio menu.
To create a new part, click the **NEW PART** button. The Add Custom Part form will be displayed:

![Add Custom Part Form](image)

- Most of the fields, other than *Part Number* and *Description*, are optional.
- You can specify labor factors on the **LABOR FACTORS** tab.

Once a part has been created, you can add it to a system by double-clicking it or selecting it and clicking the Add Part to System button.

**Submitting User Parts for Approval in the Main Parts Database**

If you want your User Parts to become part of your company’s main Parts Database so that other people can see and use them, you can submit them for approval to your company’s Parts Database Administrator. The Administrator can then fill in other required fields and import it into the main database (refer to the *Smartware Studio Setup and Administration Guide* for more detail).

- To submit a User Part, select it in the list and click the **SUBMIT FOR APPROVAL** button, or right-click it and choose the same menu item.
- You can unsubmit and edit a part, or resubmit a rejected part, in the same manner.
The status of the approval is shown in the User Parts list.
- When a part is approved, it will appear in the main Parts Database list. It will not, however, be deleted from the My Parts list unless you explicitly delete it.

**Part Packages**

You can also create and use Part Packages, which are collections of parts (as well as points and labor) that can be added as a whole. Packages are created using the Parts Database Manager (refer to the *Smartware Studio Setup and Administration Guide* for more information).

To add a package to the Part List:

- Select the **PACKAGES** tab in the Part Browser.
- Double-click the package in the package list, or select it and click the **ADD PACKAGE TO ESTIMATE** button. The items in the package will be added individually to the current system.

**The Points Tab**

The Points tab allows you to create a list of the logical and/or physical controller points in the System. These can serve a number of purposes:

- Each point adds a certain amount of labor hours to the estimate calculations.
- The total number of points in a system is a common metric for measuring the complexity of a system or project and for cross-checking the estimate calculations.
- Detailed information about the points, while optional, can be used to help document the system. Such information will be available for systems generated by the Prometheus or Designer Suite modules.
Adding Points to a System
To add a single point, click the ADD POINT button:

- The only field that you need to specify is the Point Type. All other fields are optional and do not affect the Estimate calculations.
- If you check the SHOW ENGINEERING COLUMNS checkbox, you can view or enter the advanced Engineering properties. These do not affect the Estimate calculations.
To add multiple points at once, click the SET POINT COUNTS… button:

![Enter Point Counts](image)

The points in the System’s Point List will be updated to reflect these point counts. If there was already a greater number of a certain point type, the excess items will be deleted along with any detail you may have already entered (e.g., if there were 4 AO points in the list already when these counts were entered, the last two would be deleted).
**Point Labor Settings**

There is a table of values that specify how many hours of each Labor Code are calculated for each of the point types. To view and edit this table, click the Point Settings button:

- These values are part of the Estimate Model. You can set these in an Estimate Model Template to be used for future estimates. Refer to the later chapter for more detail.
The Labor Tab

The Labor tab summarizes the labor hours calculated from the Parts and Points and allows you to add additional labor hours as line items.

The top region shows all the labor hours associated with the System.

- The items in gray are calculated totals from the other tabs.
- The Material and/or Points labor will be broken up as Typical and Not Typical, if any of the items are marked as Not Typical.
- To add additional line-item labor, click the ADD LABOR ITEM button. A new row will be added to the list. You can edit the hours for each task code directly in the list.

The bottom region shows a summary of the labor hours and their costs in dollars. The Cost per Hour for each Labor Code is specified in the Labor Settings.
**Labor Settings**

The Labor Settings are part of the Estimate Model and determine how the labor is calculated for a System. Refer to the later chapter on the Estimate Model for information on how to store these settings for use in other estimates as a Template.

To view the Labor Settings, click on the LABOR SETTINGS button:

- The *Cost Rate* determines how labor hours are translated into dollars. The figure represents the dollars per labor hour.
- The *Include Material Hours* column indicates whether the hours calculated from the Material tab are included in the calculations for that Labor Code.
- The *Include Point Hours* column indicates whether the hours calculated from the Points tab are included in the calculations for that Labor Code.
- The *Is Subcontracted* column indicates whether the hours for that Labor Code are excluded from the Estimate's labor calculations and instead included in the calculated Subcontracts.

The REPETITION CURVES tab indicates how the labor is multiplied out when the System is considered Typical Of multiple instances. Refer to the next section on *Typical Systems* for more detail.
Typical Systems
There are many cases where a System represents one of a set of identical systems. These are commonly referred to as Typical Systems, and the number of instances is called the Typical Of value.

Setting the Typical Of Value for a System
To set the Typical Of value, change the value on the Parts, Points or Labor tab of the System.

- The quantities of the Parts, Points and Labor Hours in the System will automatically be multiplied by the Typical Of value.
- The totals on each tab will indicate the totals for the first system, as well as the total for all the systems.

Not Typical Items
Each Part, Point or Labor item in a System can be marked as Not Typical. These items will not be multiplied by the Typical Of value for the System when calculating totals. Instead, they will be included only once.

- In the Labor Item list for the System, Typical and Not Typical hours for Material and Points are broken out to help illustrate the calculations.

Repetition Curves
In most cases, Typical Systems have a benefit of requiring less labor for the second and successive systems that are implemented. These reductions are represented by a Repetition Curve for each Labor Code that indicates how much labor these secondary instances require compared to the first instance.
The Repetition Curves are part of the Estimate Model. To view and edit the Repetition Curves, click the LABOR SETTINGS button and select the REPETITION CURVES tab:

There are two types of curves to represent two classes of labor and their reductions:

- **An Engineering/Software Task Curve** is designed for a task (such as Engineering and Software) in which the resulting effort can be "copied and pasted" for the secondary instances. The curve specifies a percentage for the second instance (e.g., the time it takes to convert a specific system into one where certain parameters, such as Air Flow, can be customized for each instance), and a percentage for the third and successive instances (often just adding a row to a table or spreadsheet to specify those parameters for the additional system).

- **A Cobb-Douglas Production Function Curve** is designed for other physical tasks that, presumably, the worker would be able to do faster as they develop, optimize or create assembly-line style procedures for themselves. They are essentially inverse logarithmic curves.
An example of a Cobb-Douglas curve for tasks such as Check/Test/Start:

The settings for the Repetition Curves are part of the Estimate Model, and can be saved with a template for use in other Estimates.
5. The Estimate Summary Tabs

Once the Areas and Systems have been created and the Parts, Points and Labor specified for each System, the rest of the information and tasks for completing the Estimate is specified on the tabs for the Estimate Node itself.

Selecting the Estimate Node

To view the Estimate Node tabs, simply click on the Estimate Node (E) at the top of the Estimate tree.

- You can also go directly to the Estimate Node's Summary tab from anywhere else in the Estimate by clicking the ESTIMATE SUMMARY button in the Estimate Toolbar:

The Estimate Node has a larger set of tabs, some of which are similar to those in the Areas and Systems, but which all have information that is specific to the Estimate as a whole. It is a good idea to review each tab in order as you get closer to completing an Estimate.

The Overview Tab

The Overview tab allows you to set some global values for the building. These properties affect the Global Labor Adjustments – essentially scaling up (or down) the calculated labor from the system. Refer to the later subsection on The Labor Tab for more information.
The Estimate Summary Tabs

The Material Tab
The Material Tab summarizes all the parts in the Estimate. There are three sub-tabs:

- Material By Vendor
- All Parts
- Update Parts to Database

The Material by Vendor sub-tab summarizes all the parts in the Estimate, breaking them down according to the Vendor.

Cost Escalations (for Long Term Projects)
For projects that may require multiple years to complete, you can make allowances for any expected cost inflation over time. You can specify a single escalation model for all material or custom escalations for each vendor.
To specify a Cost Escalation for a specific Vendor:

- Select the Vendor's row in the table.
- Choose the **CUSTOM ESCALATIONS** radio button.
- Fill in values for the **% in Period** and **Escalation** columns.

To specify a Cost Escalation for all Material:

- Select the first row of the table ("Default for Material").
- Fill in values for the **% in Period** and **Escalation** columns.

The amount of increase due to the Escalation, as well as the Escalated Cost, is shown in individual columns in the table as you make the changes.

**Assign Material to a Subcontract**

For some Material, specifically Wire and Conduit, you may want to transfer the cost into the calculated value of a subcontract.

- Select the Vendor's row in the table.
- In the **ASSIGN TO SUBCONTRACT FOR** list, select the appropriate Labor Code. Only those Labor Codes that have been marked as **Is Subcontracted** in the Labor Settings will be available.
- Specify whether to calculate the subcontract cost at a discount or premium by specifying the **CALCULATE COST IN SUBCONTRACT AS** percentage.

**Update Parts to Database**

There will be times, such as when revisiting an older estimate, that you will want to compare the parts in the estimate against the latest version of the Parts Database. The Update Parts to Database sub-tab provides a utility to compare and update the prices, descriptions and labor factors if they have changed.

To check the parts in the estimate with the Parts Database:

- Select the **UPDATE PARTS TO DATABASE** sub-tab
- Click the **SCAN PARTS** button
The Estimate Summary Tabs

There will be two lists of parts shown:

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Manufacturer</th>
<th>Qty</th>
<th>Bin Tag</th>
<th>Location</th>
<th>Description</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAP-360-2010A-12</td>
<td>Building Automation Products</td>
<td>1</td>
<td></td>
<td></td>
<td>DUCT AVS SENSOR MULTIPLEX COBRE COPPER 12</td>
<td>$394.00</td>
</tr>
<tr>
<td>BAP-360-2010A-12</td>
<td>Building Automation Products</td>
<td>2</td>
<td>UOB</td>
<td>s</td>
<td>DUCT AVS SENSOR MULTIPLEX COBRE COPPER 12</td>
<td>$394.00</td>
</tr>
<tr>
<td>BAP-360-2010A-12</td>
<td>Building Automation Products</td>
<td>1</td>
<td>Vitronen Elementar/TVU19</td>
<td></td>
<td>DUCT AVS SENSOR MULTIPLEX COBRE COPPER 12</td>
<td>$394.00</td>
</tr>
<tr>
<td>ENCL420699ULL</td>
<td>TAC (INVENCOM)</td>
<td>10</td>
<td></td>
<td></td>
<td>4 CHANNE AL ANALOG INPUT O/P</td>
<td>$35.00</td>
</tr>
<tr>
<td>ENCL420699ULL</td>
<td>TAC (INVENCOM)</td>
<td>1</td>
<td>Washington High School/TVU1</td>
<td></td>
<td>ENCLOSED FOR 24 &amp; MALL BLDG</td>
<td>$495.00</td>
</tr>
</tbody>
</table>

- The upper list shows any parts that have been updated. The changes will be highlighted in yellow.
- Click the UPDATE PARTS button to accept the changes. All the differences noted will be updated to match the parts database. This change cannot be undone.
- The lower list shows the parts that were not found in the Parts Database at all (and therefore cannot be updated).
- You can also show a list of the parts that are not flagged as Top Parts in your Company’s version of the Parts database by clicking the SHOW PARTS THAT ARE NOT TOP PARTS radio button.
The Points Tab

The Points tab provides a total of each point type for the entire estimate, as well as other statistics:

<table>
<thead>
<tr>
<th>Point Type</th>
<th>Point Count</th>
<th>ENG</th>
<th>SHT</th>
<th>GRAPH</th>
<th>PM</th>
<th>CTS</th>
<th>ELEC</th>
<th>MECH</th>
<th>PANEL</th>
<th>Total Labor</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>26</td>
<td>7.30</td>
<td>0.52</td>
<td>3.90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12.22</td>
</tr>
<tr>
<td>DI</td>
<td>17</td>
<td>5.10</td>
<td>0.34</td>
<td>1.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.14</td>
</tr>
<tr>
<td>AO</td>
<td>16</td>
<td>9.60</td>
<td>0.64</td>
<td>3.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13.44</td>
</tr>
<tr>
<td>DC</td>
<td>26</td>
<td>10.40</td>
<td>0.52</td>
<td>3.90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14.82</td>
</tr>
<tr>
<td>Al (terminal)</td>
<td>20</td>
<td>0.10</td>
<td>0.02</td>
<td>3.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.12</td>
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<tr>
<td>DI (terminal)</td>
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<tr>
<td>AO (terminal)</td>
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<td>0.20</td>
<td>0.02</td>
<td>4.00</td>
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<td></td>
<td>4.22</td>
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<tr>
<td>DC (terminal)</td>
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<td></td>
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<tr>
<td>S6point</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Global control</td>
<td></td>
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<td></td>
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<tr>
<td>Schedule</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>125</td>
<td>33.20</td>
<td>2.06</td>
<td>19.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>54.95</td>
</tr>
<tr>
<td>Total included in Labor</td>
<td>33.20</td>
<td>2.06</td>
<td>19.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>54.95</td>
</tr>
</tbody>
</table>

- Choose from the options in the SHOW LABOR FOR POINTS list to show how the points translate to labor in hours or dollars.
- Click the POINT SETTINGS button to access the Estimate Model settings related to Points, such as the hours per point type.
The Estimate Summary Tabs

The Labor Tab

The Labor tab summarizes the labor hours and dollars for the Estimate and provides some useful statistics:

### The Labor Tab

The Labor tab summarizes the labor hours and dollars for the Estimate and provides some useful statistics:

<table>
<thead>
<tr>
<th>Labor Code</th>
<th>Description</th>
<th>Total Hours</th>
<th>GLA Factor</th>
<th>Adjusted Hours</th>
<th>Hourly Rate</th>
<th>Total Cost</th>
<th>SubContracted?</th>
<th>Total Cost Non/Sub</th>
<th>Escalation</th>
<th>Escalated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG</td>
<td>Engineering</td>
<td>32.5</td>
<td>1.59</td>
<td>51.2</td>
<td>$40.00</td>
<td>$2,048.00</td>
<td></td>
<td>$2,048.00</td>
<td>$15</td>
<td>$2,262</td>
</tr>
<tr>
<td>SOFT</td>
<td>Software</td>
<td>90.9</td>
<td>1.00</td>
<td>90.9</td>
<td>$40.00</td>
<td>$3,636.00</td>
<td></td>
<td>$3,636.00</td>
<td>$15</td>
<td>$3,969</td>
</tr>
<tr>
<td>GRAPH</td>
<td>Graphics</td>
<td>1.00</td>
<td></td>
<td></td>
<td>$40.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM</td>
<td>Project Management</td>
<td>17.9</td>
<td>1.07</td>
<td>18.2</td>
<td>$55.00</td>
<td>$1,003.00</td>
<td></td>
<td>$1,003.00</td>
<td>$15</td>
<td>$1,111</td>
</tr>
<tr>
<td>CTS</td>
<td>Check/Test/Start</td>
<td>101.3</td>
<td>1.08</td>
<td>108.6</td>
<td>$50.00</td>
<td>$5,430.00</td>
<td></td>
<td>$5,430.00</td>
<td>$20</td>
<td>$5,892</td>
</tr>
<tr>
<td>ELEC</td>
<td>Electrical</td>
<td>425.5</td>
<td>1.00</td>
<td>425.5</td>
<td>$50.00</td>
<td>$21,275.00</td>
<td></td>
<td>$21,275.00</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>MEC</td>
<td>Mechanical</td>
<td>2.0</td>
<td>0.8</td>
<td>2.0</td>
<td>$50.00</td>
<td>$100.00</td>
<td></td>
<td>$100.00</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>PIPED</td>
<td>Piping</td>
<td>1.0</td>
<td></td>
<td></td>
<td>$40.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>687.4</td>
<td>722.7</td>
<td></td>
<td>$30,641</td>
<td>$19,614</td>
<td></td>
<td>$19,614</td>
<td>$100</td>
<td>$20,722</td>
</tr>
</tbody>
</table>

- The **GLA Factor** column represents the total adjustments from the **Global Labor Adjustments** tab.
- The Labor Codes that are indicated as **Is Subcontracted** in the **LABOR SETTINGS** are broken out from the labor calculated in the rest of the Estimate.
- Check the **SHOW ADDITIONAL COLUMNS** checkbox to see additional statistical information (such as percentage of total for each Labor Code).

### Global Labor Adjustments

The labor hours are calculated for each System and the totaled in the summary. You can also specify other properties that, taken together, create a set of **Adjustment Factors** that increase (or decrease) these totals by a certain percentage to account for these other challenges, such as:

- **Building Type** (e.g., a Prison requires more technician time than a School)
- **Retrofit Percentage** (e.g., New Construction is easier than Retrofit)
- **Building Height** (e.g., taller buildings require more on-site time to get around)
The Global Labor Adjustments are summarized and calculated on a separate tab and carried over into the Total Labor tab:

- The **BUILDING OVERVIEW** settings (which also appear on the Estimate's OVERVIEW tab) generate the first two (calculated and read-only) rows.
- The Difficulty and Experience rows shown in this image are examples of user-editable rows that were specified as part of the template.
- You can add additional rows for custom adjustments by clicking the **ADD ROW** button.
- Refer to the later chapter on *The Estimate Model* for complete information on how these adjustments are calculated and how you can add to and customize these calculations in your own templates.

Since these are multipliers, a value of 1.00 indicates no adjustment. Values above 1.00 are increases (i.e., 1.06 represents a 6% increase) and values below 1.00 are decreases (e.g., 0.98 indicates a 2% reduction, or 98% of the original).

The values for each Labor Code are multiplied together (not added!) to get the overall adjustment factors. Therefore, two factors of 1.10 (e.g., a 10% increase) each yield 1.10 x 1.10 = 1.21 (a 21% combined increase).
Cost Escalations (for Long Term Projects)

For projects that may require multiple years to complete, you can make allowances for any expected cost inflation over time. You can specify a single escalation model for all labor or custom escalations for each labor code.

The Cost Escalations are specified on the Cost Escalations sub-tab:

To specify a Cost Escalation for a specific Labor Code:
- Select the Labor Codes row in the table.
- Choose the Custom Escalations radio button.
- Fill in values for the % in Period and Escalation columns.

To specify a Cost Escalation for all Labor:
- Select the first row of the table ("Default for Labor").
- Fill in values for the % in Period and Escalation columns.

The amount of increase due to the Escalation, as well as the Escalated Cost, is shown in individual columns in the table as you make the changes.
The Subcontracts Tab
As seen on the other tabs, you can "move" certain vendor material and labor hours off of the main estimate and indicate that it will part of a separate subcontract. By specifying the settings, an estimated cost for the subcontracts will be calculated. These estimates can then be replaced by actual costs as information from the expected subcontractors is received.

Creating Subcontracts for Labor Codes
In the SUBCONTRACTOR SETTINGS (or LABOR SETTINGS from other tabs), you can indicate which labor codes should be used to create Subcontracts. You can also indicate the hourly rate to use when converting the estimated hours to dollars for estimating the subcontract:

![Subcontractor Labor Settings](image)
**Reviewing and Updating the Subcontract List**
The Subcontracts list shows a line item for each labor code that is subcontracted:

- You can force a vendor's material onto a subcontract by selecting the **ASSIGN TO SUBCONTRACT** field in the Estimate's Material tab. Refer to the earlier section *The Material Tab* in this chapter for more detail.
If you have a quote or estimate from the subcontractor, you can override the calculated amounts in the table:

- Click the ADD SUBCONTRACTOR button to add a row to the table.
- Fill in the Vendor Name and the Quote Amount fields.
- Check the Include box for the actual quote line.
- Uncheck the Include box for the calculated line.

<table>
<thead>
<tr>
<th>Include</th>
<th>Calculated</th>
<th>Labor Code</th>
<th>Vendor Name</th>
<th>Hours</th>
<th>Est Rate</th>
<th>Labor</th>
<th>Material</th>
<th>Quote Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ELEC</td>
<td></td>
<td>466.64</td>
<td>$105.00</td>
<td>$48,787</td>
<td>$0</td>
<td>$48,787</td>
</tr>
<tr>
<td>✔</td>
<td>✔</td>
<td>MECH</td>
<td></td>
<td>0.22</td>
<td>$110.00</td>
<td>$24</td>
<td>$0.352</td>
<td>$4,076</td>
</tr>
<tr>
<td>✔</td>
<td>✔</td>
<td></td>
<td>Joe's Wire and Cable</td>
<td>0.00</td>
<td>$0.00</td>
<td>$0</td>
<td>$0</td>
<td>$41,350</td>
</tr>
</tbody>
</table>
The Expenses Tab
The Expenses Tab has several sub-tabs that allow you to add other allowances and expenses to the Estimate.

**Travel Expenses**
Smartware Studio can calculate an estimate of the travel expenses based on the number of hours estimated for each labor code and the travel distance and cost from your office to the job site.

- Fill in the DISTANCE TO JOB SITE field to calculate the mileage cost.
- Adjust the other fields to customize the costs.
- The $ PER MILE and (Hotel) COST PER STAY values become part of the Estimate Model template. Refer to the later chapter for more detail.
The calculation for the number of trips is based on the percentage of time (for each labor code) that the worker will need to be on-site and the number of on-site hours per visit. You can update these parameters by clicking LABOR CODE TRAVEL SETTINGS:

- Labor Codes that are subcontracted are automatically excluded, regardless of these settings.
- These settings can be saved as part of an Estimate Model template. Refer to the later chapter for more detail.
**Taxes and Freight**

You can specify separate *Tax Rates* for each of the four main categories of costs: Material, Labor, Subcontracts and Expenses. You can also specify the rate for calculating estimated *Freight* costs.

![Image of Tax Rates and Freight settings]

- These settings are part of an Estimate Model template. Refer to the later chapter for more detail.
## Allowances

You can add allowances for *Warranty* costs, *Bonds*, *Service Agreements* and general *Risk and Overhead*. These items are itemized on the Estimate Summary tab and report.

<table>
<thead>
<tr>
<th>Allowance Type</th>
<th>Material</th>
<th>Labor</th>
<th>Subcontracts</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty</td>
<td>2.0 years @ 3.00 % of</td>
<td>1.00 years @ 1.00 % of</td>
<td>1.0 years @ 0.50 % of</td>
<td>$19,615 = $1,176.90</td>
</tr>
<tr>
<td>Bonds</td>
<td>Bid Bond 1.50 % of</td>
<td>Performance Bond 0.75 % of</td>
<td></td>
<td>$50,000 = $750.00</td>
</tr>
<tr>
<td>Service Agreement</td>
<td></td>
<td></td>
<td>Allowance for Service Agreement:</td>
<td>$1,200</td>
</tr>
<tr>
<td>Risk</td>
<td>3.00 % of</td>
<td></td>
<td></td>
<td>$83,813 = $2,514.38</td>
</tr>
<tr>
<td>Overhead</td>
<td>15.00 % of</td>
<td>0.00 % of</td>
<td>0.00 % of</td>
<td>$19,615 = $2,942.24</td>
</tr>
</tbody>
</table>

- All these settings are part of an Estimate Model template. Refer to the later chapter for more detail.
**Other Expenses**

Any other expenses not covered anywhere else can be added on the OTHER tab.

<table>
<thead>
<tr>
<th>Expense</th>
<th>Expense Description</th>
<th>Expense Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Del 1</td>
<td>B&amp;O Taxes</td>
<td>$1,350.00</td>
</tr>
<tr>
<td>Del 2</td>
<td>Marketing</td>
<td>$750.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$2,100.00</strong></td>
</tr>
</tbody>
</table>

- Click the ADD EXPENSE button to add a new, editable row to the list.

**The Summary Tab**

The SUMMARY tab is the central location for reviewing the totals and breakdowns for all elements of the Estimate.

- You can also go directly to the Estimate Node's Summary tab from anywhere else in the Estimate by clicking the ESTIMATE SUMMARY button in the Estimate Toolbar:
The Summary tab contains a table of all the estimate costs in the upper region and the controls for calculating the *Profit* and *Contract Amount* in the lower region:

- The first column of figures is the total for the Estimate. The other four columns show the breakdown of costs by the four major categories.
- As you hover the mouse cursor over a cell or amount, it will highlight to indicate that you can click on it to jump to the tab that shows the detail for that figure. Use the **ESTIMATE SUMMARY** button in the toolbar to quickly jump back.
- The **ESTIMATE SETTINGS** button allows you to change all of the Estimate Model settings in one place. Most of these settings are available separately from buttons on other tabs, such as **POINT SETTINGS** or **SUBCONTRACT SETTINGS**. It also provides the place to import or export the settings to a template file. Refer to the later chapter *The Estimate Model and Templates* for more detail.
The Estimate Summary Tabs

The ALSO SHOW list allows you to juxtapose some additional columns, such as % of Total Cost:

<table>
<thead>
<tr>
<th>Total</th>
<th>% Material</th>
<th>% Labor</th>
<th>% Subcontract</th>
<th>% Expenses</th>
<th>% Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Itemized Cost</td>
<td>90,194</td>
<td>90.0%</td>
<td>19,615</td>
<td>10.6%</td>
<td>16,044</td>
</tr>
<tr>
<td>Cost Escalations</td>
<td>443</td>
<td>0.4%</td>
<td>293</td>
<td>0.3%</td>
<td>145</td>
</tr>
<tr>
<td>Taxes</td>
<td>7,071</td>
<td>0.9%</td>
<td>1,507</td>
<td>1.6%</td>
<td>1,304</td>
</tr>
<tr>
<td>Freight</td>
<td>697</td>
<td>0.8%</td>
<td>697</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td>Travel Expenses</td>
<td>2,271</td>
<td>2.2%</td>
<td></td>
<td></td>
<td>2,271</td>
</tr>
<tr>
<td>Warranty</td>
<td>1,564</td>
<td>1.5%</td>
<td>1,177</td>
<td>1.1%</td>
<td>160</td>
</tr>
<tr>
<td>Bonds</td>
<td>1,313</td>
<td>1.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Agreement</td>
<td>1,200</td>
<td>1.2%</td>
<td>1,200</td>
<td>1.2%</td>
<td></td>
</tr>
<tr>
<td>Risk</td>
<td>2,496</td>
<td>2.4%</td>
<td></td>
<td></td>
<td>2,496</td>
</tr>
<tr>
<td>Overhead</td>
<td>2,342</td>
<td>2.3%</td>
<td>2,342</td>
<td>2.5%</td>
<td></td>
</tr>
<tr>
<td>Total Cost</td>
<td>102,171</td>
<td>100.0%</td>
<td>26,362</td>
<td>25.6%</td>
<td>17,717</td>
</tr>
<tr>
<td>Markup/Margin</td>
<td>19,070</td>
<td>19.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract Amount</td>
<td>122,241</td>
<td>118.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Calculating the Contract Amount

You can calculate the Contract Amount by specifying any of the following:

- The MARKUP percentage (the amount of the Contract Amount that is profit)
- The MARGIN percentage (the amount of profit as a percentage on top of the Total Cost)
- The MARKUP/MARGIN in dollars
- The CONTRACT AMOUNT itself

When you change any of these values, the other values update accordingly. You can also select the MARKUP or MARGIN percent from the table on the right by double-clicking the row.
6. Reports

Once created, Smartware Studio can generate a full range of reports of the data in your Estimate. These reports can be created in Microsoft Excel and PDF formats.

- You must have Microsoft Excel installed on your computer to generate any reports. You can use Excel 2002 (Excel XP), Excel 2003, Excel 2007* or Excel 2010.
- Some additional configuration is required to generate PDF files. Refer to the Configuring a Smartware Studio Workstation chapter of the Smartware Studio Setup and Administration Guide.

\*Note: There is a known problem with Excel 2007 (and only Excel 2007). If you attempt to print the report immediately after it is created, an error regarding the “Print Area” will occur. The workarounds are:

- Do not select the Send Reports to Printer option when generating the report. Instead, choose only the Save Reports in Excel option and then open the report directly from the Files tab. You should then be able to print it without problems.
- Upgrade to Excel 2010.
Generating Reports
Reports are created by selecting the Estimate node in the Estimate tree and then selecting the Reports tab:

- You can run as many reports as you want at one time. Multiple reports are generated into a single Excel Workbook (with multiple worksheets) and/or PDF document.
- The generated Excel and PDF files are saved on the FILES tab of the Estimate node.

Creating Custom Reports
The reports are generated from templates created in Microsoft Excel. You can create new reports by copying existing reports and modifying them as you need.

Reports are stored in the `Reports\Estimating` subfolder of Smartware Studio, usually:

```
C:\Program Files\Smartware Technologies\Smartware Studio\Reports\Estimating
```
If you copy your reports into this folder, they will be available in the Report list.

- Do NOT modify the standard reports and overwrite the originals with your changes. Your changes will be lost with the next update to Smartware Studio. Always work with a renamed copy of a standard report.

**Distributing Custom Reports to Other Users**

You can easily share your custom reports with the other users in your Company. There is a sub-folder in your shared folder on your file server that Smartware Studio will automatically check for new report files. If you copy your custom reports there, Smartware Studio will automatically download them onto the local workstation the next time it starts up.

- You may have to create this sub-folder on your server by hand.

If the shared folder on your file server is:

   \*\OurServer\Smartware Studio Data

Then the distribution folder for custom Estimate reports is:

   \*\OurServer\Smartware Studio Data\Distribute\Reports\Estimating\
7. The Estimate Model and Templates

There are a number of parameters and settings that are used throughout the Estimate that affect how the calculations are performed. Together they are referred to as the Estimate Model.

Very often these settings can be configured once for a company and then rarely changed from Estimate to Estimate. To make this easier, you can save these settings into a file called an Estimate Model Template. You can then share the template, use the template as the starting point for new estimates and update an existing estimate with a template’s values.

Accessing the Estimate Model

The Estimate Model settings are viewed and edited in the Estimate Settings dialog, which is brought up from a number of locations throughout the Estimate.

For a specific portion of the Estimate Model, use:

- The POINT SETTINGS button on the Points tab
- The LABOR SETTINGS button on the Labor tab
- The GLOBAL LABOR ADJUSTMENT SETTINGS on the Global Labor Adjustments sub-tab (on the Labor tab).
- The SUBCONTRACTOR SETTINGS on the Subcontracts tab
- The LABOR CODE TRAVEL SETTINGS button on the Expenses/Travel tab

To access the complete Estimate Model, along with the Template management features:

- The ESTIMATE SETTINGS button on the Estimate Summary tab
- Right-clicking the Estimate node and selecting the TOOLS ➔ ESTIMATING ➔ ESTIMATE MODEL menu item
The Estimate Model Parameters
The following settings are part of the Estimate Model. Refer to the earlier chapters on *Estimating a System* and the *Estimate Summary Tabs* for more detail.

- Labor Codes and parameters (e.g., *Cost per hour, Is Subcontracted, Requires Travel*, etc.)
- Labor by Point Type (the amount of labor hours per point)
- Repetition Curves (how labor is reduced for Typical Systems)
- Global Labor Adjustments (how labor is increased [or decreased] based on properties of the building and project)
- Travel Expenses, Freight, Taxes and Allowances

Global Labor Adjustments
The Global Labor Adjustments tab contains detailed information about how the Building Overview settings (on the Overview tab or the Labor/Global Labor Adjustments tab) are used to calculate the Global Labor Adjustment Factors. These settings are normally not adjusted on a per-estimate basis, but instead are updated by a company and distributed as a template.
Building Types Table

The Building Types Table lists all the different Building Types and specifies adjustment factors for each labor code. There are two rows for each Building Type – one that indicates the factors for a New Build (0% Retrofit) and another for 100% Retrofit.

When a Building Type and/or Percent Retrofit value is selected or changed in the estimate, the system calculates the adjustment factors as a straight-line interpolation between the two rows. For example, if the New Build value is 1.00 and the 100% Retrofit value is 1.20, then:

- With Percent Retrofit = 0%, the calculated factor will be 1.00
- With Percent Retrofit = 25%, the calculated factor will be 1.05
- With Percent Retrofit = 100%, the calculated factor will be 1.20

You can modify the factors for the existing Building Types and you can add your own.

- To modify the factors for an existing type, edit the values in the green cells.
- To create a new Building Type, click ADD BUILDING TYPE.
- To rename an existing or custom Building Type, click EDIT BUILDING TYPE.
Building Height Table
The Building Height Table determines how the height of the building is used to calculate the Building Height adjustment factors.

The table on the right shows sample values for specific numbers of floors. The values are calculated using a formula with two parameters:

- The **Increment** value for each Labor Code indicates how much the factors increase for each doubling of the number of floors. It is specified as a value from 0 to 100, representing increments from 0.000 to 0.100. In the example above, the Increment for CTS is 35, so as the number of floors doubles, the factor increases by 0.035 (e.g., 1.00, 1.035, 1.070, 1.105, 1.140, etc).

- The **First Floor that Affects Labor** parameter allows you to shift the entire table down by indicating when the increments should begin.

When the number of floors is selected for the Estimate, these parameters are used in a formula to calculate the adjustment factors. It is a logarithmic function, and not a straight-line interpolation.
Additional Adjustments

You can also create additional rows for factors that the user can specify. There are two types of these rows: In the Model and In the Estimate.

- When entered here in the Estimate Settings dialog, the rows become part of the Estimate Model and will be included in the Templates. When the user completes the estimate, they will see these rows on the Global Labor Adjustments tab and can enter values for the factors. They will not, however, be able to change the description or delete the row. These In the Model rows are meant for adjustments that the company wants considered for every estimate.

- The estimator can also add rows while on the Global Labor Adjustments tab. Those In the Estimate rows are fully editable by the user, and will not be saved as part of the Estimate Model Template if exported.
Expenses and Allowances

Most of the values on the Expenses tab of the Estimate Node are stored in the Estimate Model, and can be edited on the Expenses and Allowances tab of the Estimate Settings dialog. These include:

- Travel Parameters (*Cost per Round Trip* and *Hotel Cost Per Stay*)
- Taxes and Freight
- Allowances (*Warranty*, *Bonds*, *Service Agreement*, *Risk* and *Overhead*)

The other Travel parameters that are likely to vary from job to job (such as *Distance to Job Site*, *Average Travel Speed*, *Tolls*, etc.) are not included in the Estimate Model.

Estimate Model Templates

You can save and load the Estimate Model settings to and from files called *Estimate Model Templates*. To create and manage the Templates, select the IMPORT/EXPORT ESTIMATE MODEL TEMPLATES tab in the Estimate Settings dialog:

- To save the settings in the current estimate to a Template, click the EXPORT THIS ESTIMATE'S MODEL AS TEMPLATE button.
- You cannot overwrite the 'Default' template.
To load some or all of the settings from a Template into the current estimate, click the LOAD MODEL FROM TEMPLATE INTO THIS ESTIMATE button.

- To select a template to use as the default settings for any new estimates, select it in the DEFAULT TEMPLATE FOR NEW ESTIMATE list.
- To delete a local template you created, select it in the Local Templates list and click DELETE TEMPLATE LOCALLY.

**Loading Specific Model Elements into an Estimate**

When loading the settings from an Estimate Model Template into the current Estimate, you can control which portions of the Template's Model are imported. This allows you to bring in portions that have been updated (such as the Global Labor Adjustment Tables) in a template, without overwriting values that were customized in the Estimate (such as the Expenses and Allowances).

When you select Load Model from Template into this Estimate, you will be given the choices of what to import:

![Load Estimate Model Template From...](image_url)
**Sharing Estimate Model Templates**

If you have the appropriate permission, you can copy templates to the server for all users to have.

- To copy your template to the server, select it in the LOCAL TEMPLATES list and click the right-pointing arrow.
- All templates on the server are automatically downloaded to each user’s workstation any time they start Smartware Studio.
- You can also access the Estimate Model Template management features from the Smartware Studio TOOLS→OPTIONS dialog on the ESTIMATING tab.
- If Permissions are enabled for your Company, you must have the *Upload Templates to Server* Project Permission for Estimate Projects in order to upload your templates to the server. Refer to the *Smartware Studio Setup and Administration Guide* for more information.
8. Working with Other Applications

The Estimating Module is just part of Smartware Studio. Information can be exchanged and imported with a number of other modules and third party applications.

Importing from Concerto Suite (SOCC)
If you have an existing estimate created with Concerto Suite/SOCC you can import much of its data into a Smartware Studio Estimate.

- You do not need to have Concerto Suite installed on your computer to import an estimate.

Only the following information will be imported:

- Area and System Tree (with Typical Of values and Excluded flags)
- Parts and Labor

No other values or settings are imported. These include: Global adjustments, labor rates, cost escalations, template values, travel expenses, allowances, taxes, etc.

To import a Concerto Suite estimate:

- Create a new Estimate
- Right-click on the Estimate node and select the TOOLS ➔ ESTIMATING ➔ IMPORT FROM SOCC menu item.
- Browse to the .KST file and click OPEN. By default it will look in the C:\Concerto Suite Projects, but you can open an estimate from any folder.

The import will do the following:

- The Areas and Systems will be created in the Estimate tree.
- The Parts will be populated in each System's Parts list. The labor factors, prices and multipliers will be taken directly from the SOCC estimate. They will not be updated automatically.
- The POINTS items will be moved to the System's Points tab.
- The HRS items will be moved to the System's Labor tab.
Importing from Designer Suite
You can import the system information from a Designer Suite drawing file into an Estimate.

Before you import a Designer Suite drawing, you will need to point Smartware Studio to your Designer Suite Parts Database. This version of the database will not be used for pricing.

- Open the Smartware Studio TOOLS→OPTIONS dialog.
- Select the PARTS DATABASE tab.

- Browse to the Designer Suite Parts Database on your machine. The normal folder is \Program Files\Designer Suite 2005\Db). If Designer Suite is not installed on your machine, you can copy the database file from another machine to any folder and point to it.

You will also need Microsoft Visio installed on your machine to open the drawing file.
To import a Designer Suite drawing:

- Create a new System in your estimate.
- Copy/Paste or drag and drop the Designer Suite drawing file (.vsd) onto the System's Files tab.
- Right-click on the System node and select the TOOLS ➔ DESIGNER SUITE ➔ IMPORT DESIGNER SUITE DRAWING menu item.
- Select the drawing file and click OPEN.

All the parts in the drawing file will be imported into the Parts list of the System:

- The Smartware Studio Parts Database (not the Designer Suite Parts Database) will be used to lookup current pricing, descriptions and labor factors.
- The Points tab will also be populated with information from controller points, sensors and I/O Point shapes.

**Using Prometheus**

The Prometheus Wizards allow you to design a system by answering a series of questions specific to a type of system. The part and point list will be generated automatically and transferred into your system.

Prometheus will be available soon.