

DDC Points Lists Tool Suite

Overview

This document details the instructions on using the “suite of tools” referred to as “DDC Points”. This simply describes a file containing a compilation of different spreadsheets that can be used in the accounting of DDC system point and controller quantities.

A typical networked DDC project will consist of a network of configurable controllers, with each controller programmed to operate a single piece of equipment or subsystem. The spreadsheets, or “workbooks”, in this tool suite allow the user to compile points lists on a “per controller” basis. For the project consisting of a single configurable controller, a single worksheet can be used. For projects with multiple configurable controllers, workbooks are provided that consist of multiple controller worksheets and a summary page. The summary page pulls all pertinent information from all controller worksheets into a front page, for a quick overview of a multi-controller project.

Many networked projects will also include numerous “application specific controllers” (ASCs), operating various unitary equipment such as packaged rooftop units and terminal units (VAV and/or fan powered boxes). The suite includes a workbook to cover these types of controllers, so that a project with both configurable controllers and application specific controllers can be accommodated with this suite of tools.

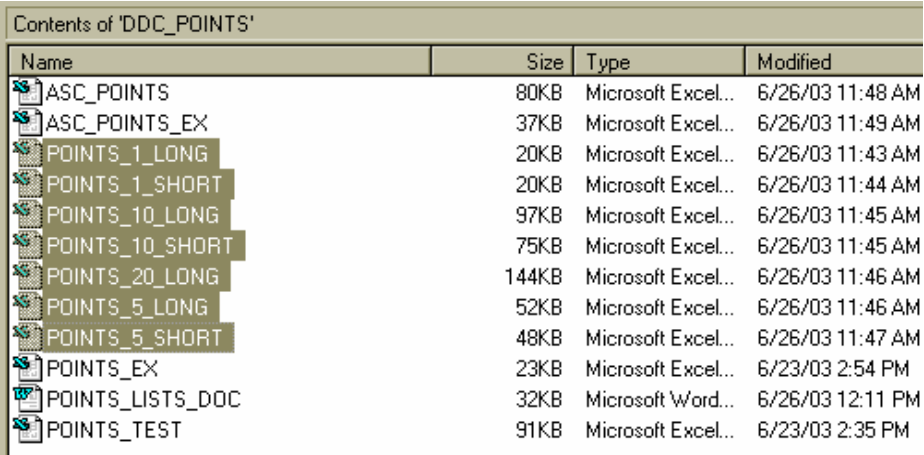
While the workbooks for the configurable controllers will help to generate overall point counts for these devices, the workbook for the application specific controllers is geared more toward controller types and counts, and not as much toward hard point counts. These types of controllers typically have concentrated point counts, and are preconfigured to handle specific applications. For instance, an ASC designed to control a VAV box with electric reheat will minimally have the following points: an input for space temperature, an input for primary airflow, an output for the primary air damper, and several outputs for stages of electric heat.

While this information is important, it does not necessarily convey the scope and magnitude of a project. It's generally better to concentrate on controller counts with these controllers, and simply regard the individual controller point counts as more or less “informational details”.

The purpose of this tool suite is multi-leveled. It can be used in the prebid phase of a potential project, to account for all points and controllers, in preparation of a formal estimate and proposal. It can be used to generate points and controller lists for inclusion in a temperature controls submittal, one that is required to be turned in to the consulting engineer for review and approval. It can be used as the first step in designing a DDC system and generating control drawings. And finally, points and controller lists generated with these tools can be included as part of the control drawings and as part of the job closeout (as built) documentation.

Selecting a Workbook

There are several different workbooks to choose from for configurable controller applications. For the project with the single stand-alone controller, choose either of the “1” files to work with. For projects with up to five controllers, choose either of the “5” files to work with. For projects with up to ten controllers, choose either of the “10” files to work with. And for projects with up to twenty controllers, choose the “20” file to work with.

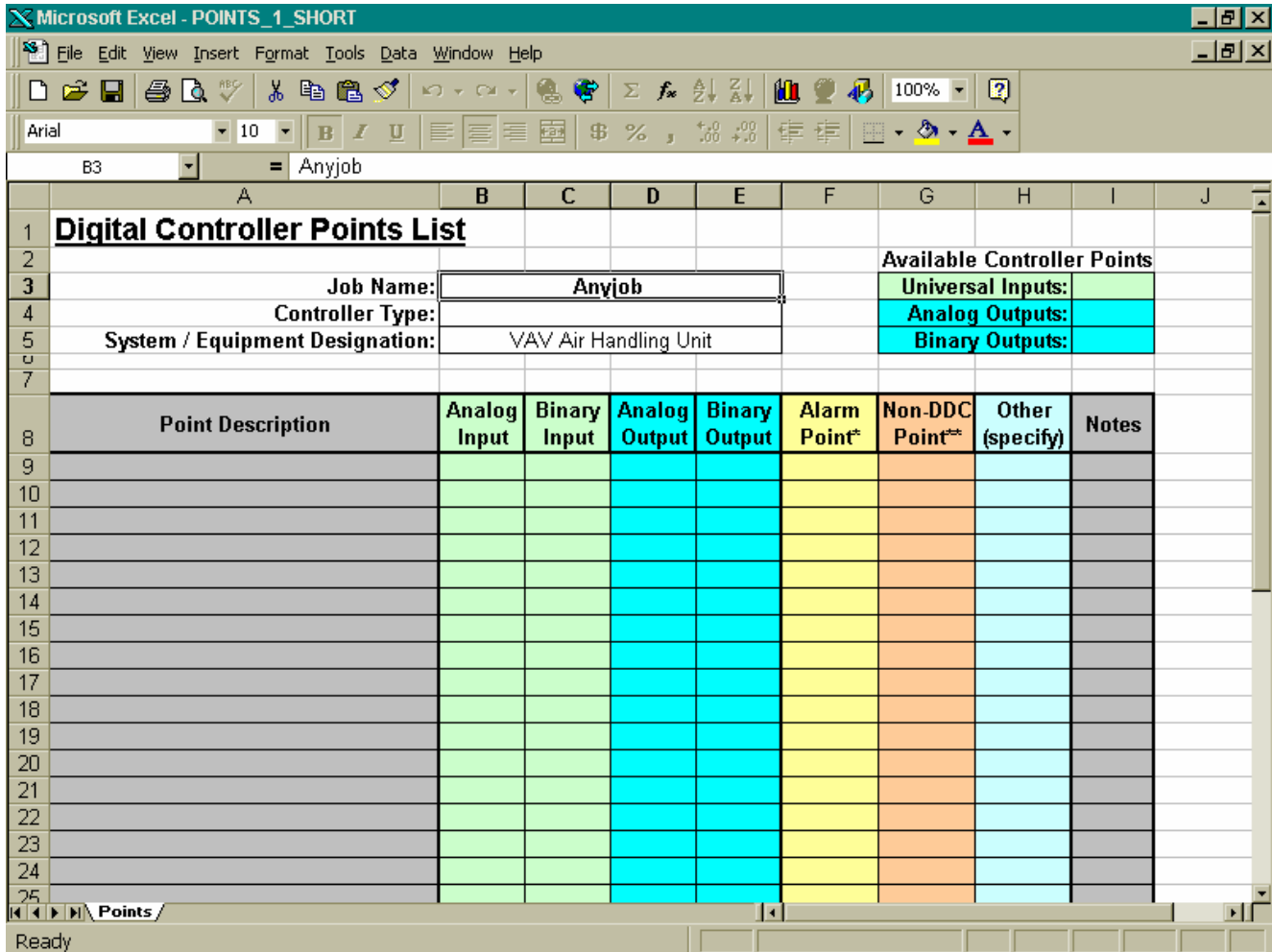


Name	Size	Type	Modified
ASC_POINTS	80KB	Microsoft Excel...	6/26/03 11:48 AM
ASC_POINTS_EX	37KB	Microsoft Excel...	6/26/03 11:49 AM
POINTS_1_LONG	20KB	Microsoft Excel...	6/26/03 11:43 AM
POINTS_1_SHORT	20KB	Microsoft Excel...	6/26/03 11:44 AM
POINTS_10_LONG	97KB	Microsoft Excel...	6/26/03 11:45 AM
POINTS_10_SHORT	75KB	Microsoft Excel...	6/26/03 11:45 AM
POINTS_20_LONG	144KB	Microsoft Excel...	6/26/03 11:46 AM
POINTS_5_LONG	52KB	Microsoft Excel...	6/26/03 11:46 AM
POINTS_5_SHORT	48KB	Microsoft Excel...	6/26/03 11:47 AM
POINTS_EX	23KB	Microsoft Excel...	6/23/03 2:54 PM
POINTS_LISTS_DOC	32KB	Microsoft Word...	6/26/03 12:11 PM
POINTS_TEST	91KB	Microsoft Excel...	6/23/03 2:35 PM

For the “1”, “5”, and “10” files, there are two choices: the “long” and the “short”. These terms relate to the controller points list worksheets, and how much room is allotted for the entry of points. If you foresee your project at hand to require many, many points per controller (both digital and non-DDC), along with other miscellaneous details to be included, then use the long form. The short form is appropriate for many of the more typical types of systems and equipment, and should be able to be used for most applications.

Working within a Workbook

For the “single controller” workbooks – the file opens up to a single worksheet. At the top, enter Job Name, Controller Type, and System / Equipment Designation. Also at the top, enter the available points that the chosen controller is capable of handling.



The file entitled “POINTS_EX” is a sample points list for a single controller. Please refer to this file as you read through these instructions.

Begin by entering all required analog and binary points to be tied in to the controller, with a description of each. Enter a 1 in the appropriate field for each point. You can combine more than one point description on a single line. For example, you can use a single line to describe “mixed air & discharge air temperature”, by entering a 2 in the corresponding Analog Input field. Likewise, you can describe “fan start/stop & status” with a single line, by entering a 1 in both the Binary Input and Binary Output field of that line.

Here’s a tip: enter the all required points before choosing a controller and before entering the Available Controller Points. When complete, the Spare Inputs and Spare Outputs fields will show (with a minus sign) the number of each type of point required for the application. From there you can then choose a controller with the appropriate number of points to cover the application.

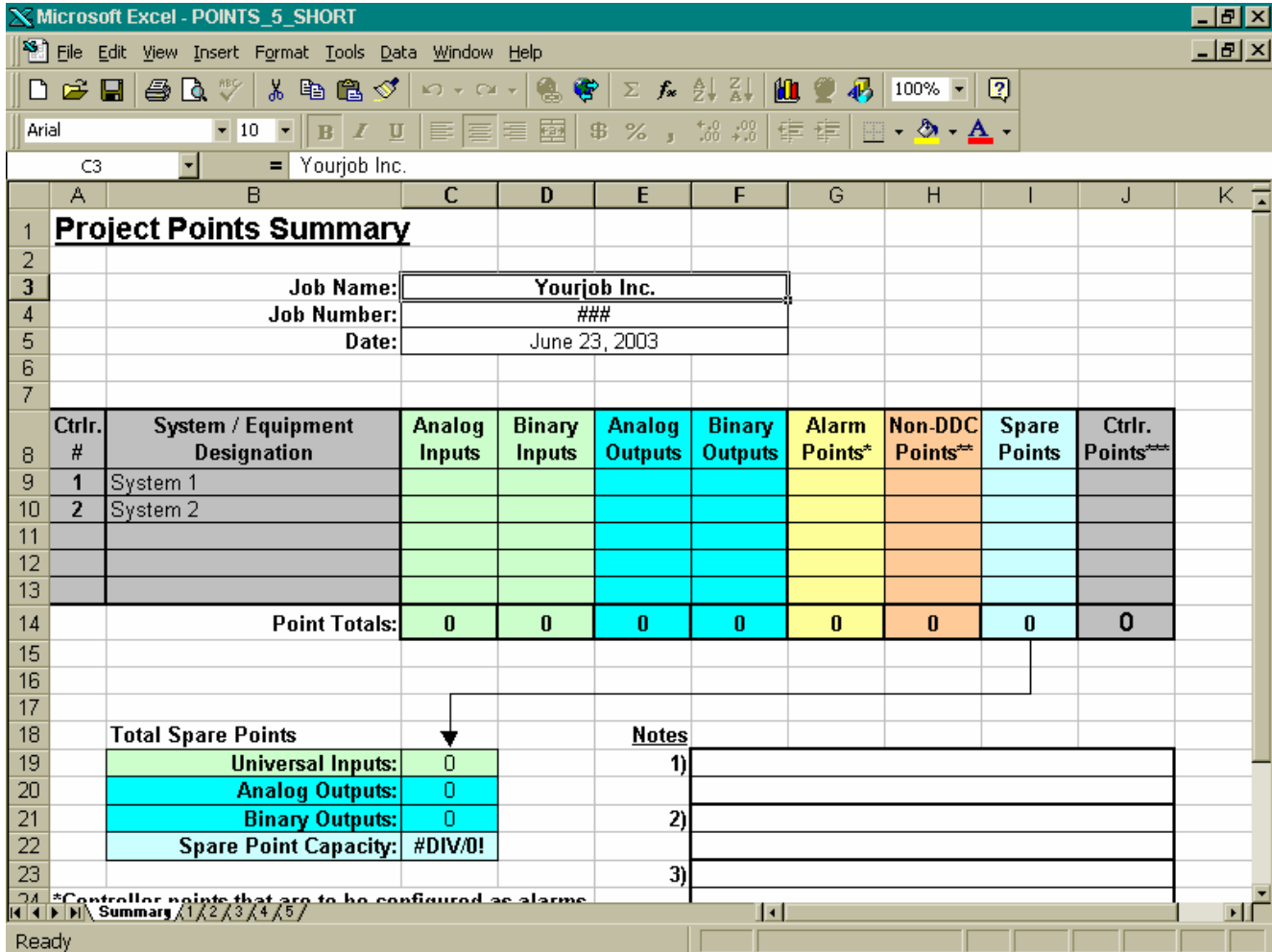
If an input is to be utilized as an alarm function, then enter a 1 in the Alarm Point column for that particular input.

Enter all non-controller points, such as safeties and limits, and place a 1 in the Non-DDC Point column for each entry.

The "Other" column can be used for multiple purposes. Refer to the sample points list for a couple of examples.

Handle any point-specific notes and remarks by referencing a note number in the appropriate Notes field and typing the associated note at the bottom in the corresponding field.

For the "multiple controller" workbooks – the file opens up to a summary page. Enter the Job Name, Job Number, and Date at the top of this sheet. Also enter any overall notes or remarks about the project at the bottom of the sheet. All other entries will be made on the individual controller worksheets, with necessary values automatically brought up front to this summary sheet.



On each subsequent worksheet, the Job Name will automatically carry over from the summary sheet. You need not enter this, however you do need to still enter Controller Type and System / Equipment Designation, per worksheet. You also need to enter the Available Controller Points per sheet. Finally, enter a controller number per worksheet. This can be done numerically (1, 2, 3, etc.), but is not limited to this. For example, on a four-controller project, controllers can be designated as 1a, 1b, 2a, and 2b. These designations will automatically carry over to the summary sheet.

Follow the instructions laid out previously for the single controller workbooks, for each individual controller worksheet. When complete, the summary will show each controller, its numeric and written designation, and its point totals, including alarm points, non-controller points, and spare points. It will give a grand total of all controller points, and will show how many spare points remain between all of the controllers.

Using the ASC Workbook

The file opens up to summary page. Enter the Job Name, Job Number, and Date at the top of this sheet.

Application	Controller Type	Quantity	Notes
Packaged Rooftop Units	ASIC/1 - 8355		
VAV Boxes - Cooling-only	ASIC/1 - 8055		
VAV Boxes with Reheat	ASIC/1 - 8055		
[Series / Parallel] Fan Powered Boxes	ASIC/1 - 8055		
Fan Coil Units - Staged Heat & Cool	ASIC/1 - 8355		
Fan Coils - Staged Heat & Prop Cool	ASIC/1 - 8255		
Fan Coils - Prop Heat & Staged Cool	ASIC/1 - 8255		
Fan Coils - Proportional Heat & Cool	ASIC/1 - 8255		
Fan Coil Units - Dual Temperature	ASIC/1 - 8255		
Other	ASIC/1 -		

Total Quantity of Application Specific Controllers:

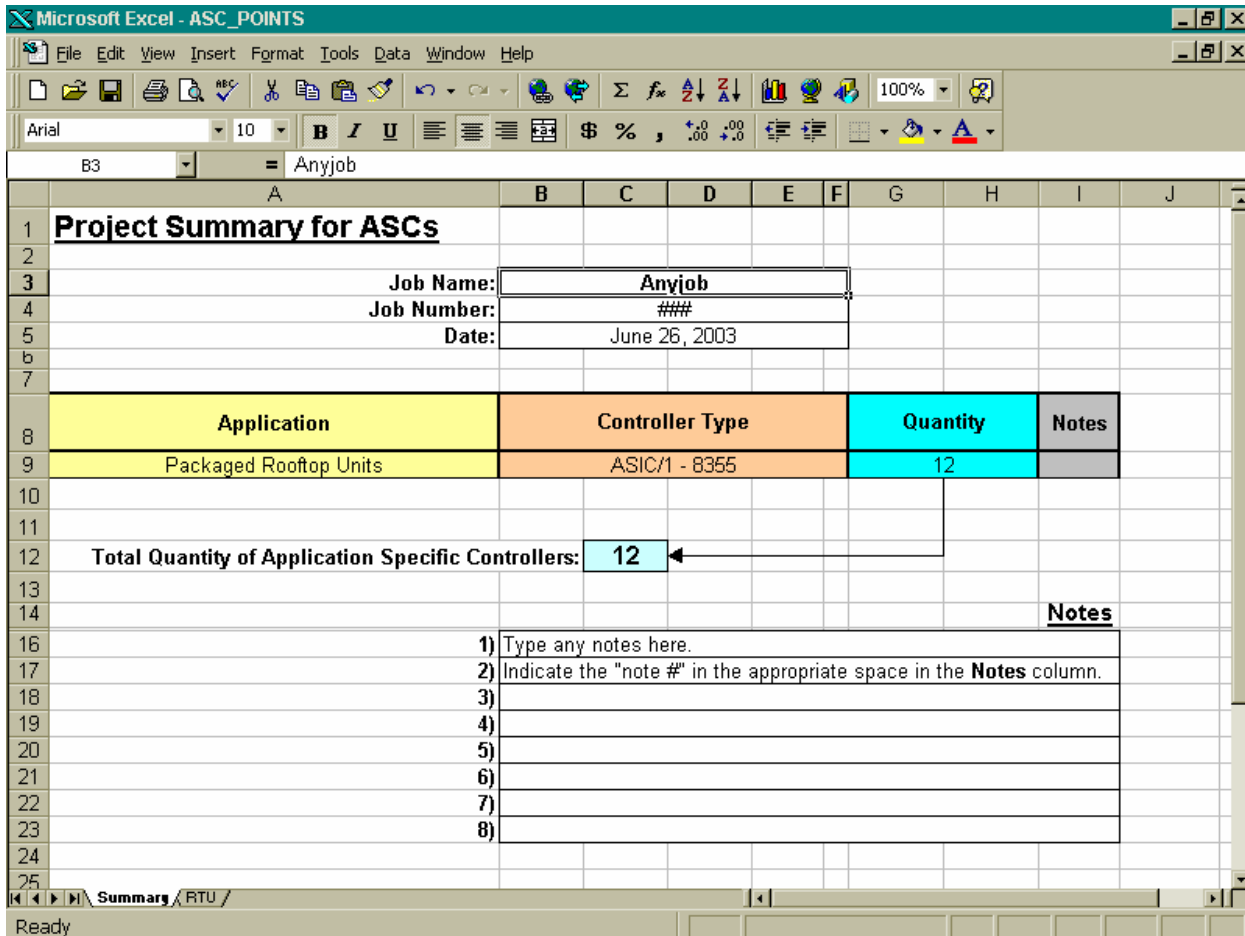
Notes

A typical project will only require the use of a few of the worksheets, if not just one or two. For the particular project, choose which worksheets most closely apply, and disregard the rest (for now). Go to the (first) worksheet that fits the application, and modify it as required. For instance, you may need to add another analog input for the particular application. Or you may want to delete some items that are included in the “template”. When finished tailoring the worksheet to the specific application, handle any point-specific notes and remarks by referencing a note number in the appropriate Notes field and typing the associated note at the bottom in the corresponding field.

Point Description	Point Type	Alarm Point?	Notes
Space temperature	Analog input	Yes	
User adjust	Analog input		
Discharge air temperature	Analog input	Yes	
Fan proving switch	Binary input	Yes	
User override into Occupied Mode	Binary input		
Supply fan start/stop	Binary output		
Heat stage one	Binary output		
Heat stage two	Binary output		
Cool stage one	Binary output		
Cool stage two	Binary output		

Before you leave the worksheet, modify Controller Type and Application at the top, if the default entries differ from your requirements. Finally, enter the Controller Quantity at the top right.

Once all “unreferenced rows” are deleted, the summary sheet will correctly tally the total number of controllers, as taken from the worksheets.



As the finishing touch, add any overall notes or remarks about the project at the bottom of the summary page.