SmartVAV: Software Engineering Process (MPX Controllers)

The easiest and most successful method of installing this application is the following process. This can be completed on a live system with AS controllers tied to EBO, or by using the PCT. The use of PCT for offline engineering is the most efficient method and is highly recommended. The outputs of the Hardware Engineering process can also greatly reduce the time required, allowing for quick creation of multiple, pre-configured controller objects.

Configure the PCT

The use of PCT for offline engineering is the most efficient method and is highly recommended.

A. Launch PCT

B. Create a PCT project

1. Right-click in the open space of the Projects tab and select Create from the menu
2. Double-click on the project name field and enter the appropriate project name

C. Save the project

1. Right-click on the project and Select Save from the menu

D. Open the project

E. Create server(s)

1. Create an ES if the project has more than one hardware server or reports are required
2. Create each ASP or ASB using the default IP addresses unless you know the final project IP addresses

F. If an ES has been added, establish a parent-child relationship between the hardware servers and the enterprise server

Note: Both ES and AS-# must be started prior to establishing parent-child relationship

G. Start the Enterprise server and any hardware servers you will be working with

H. Launch SBO workstation and connect to the Enterprise or Automation Server

Configure SBO Servers (Automation Server/Enterprise Server)

A. Create a BACnet Interface

You will need a BACnet Interface to communicate with any BACnet devices.

1. Right Click the Server or root folder
2. Select a New -> Interface
3. Select a BACnet Interface
4. Click Create

B. Set the Configuration Settings for the BACnet Interface Advanced Polling Configuration

Changing the configuration settings allows for a more robust BACnet polling system. You can find these configuration parameters in the properties of the BACnet Interface. The Advanced Polling Configuration is located on the bottom of the Advanced tab.

1. Change Minimum polling interval for local IP network (ms) = 3000
2. Change Minimum polling interval for remote networks (ms) = 5000
3. Change Minimum polling interval for MSTPA network (ms) = 5000

4. Change Minimum polling interval for MSTPB network (ms) = 5000
5. Save

C. Create an IP Network

You will need an IP Network to create any MPX BACnet devices. The Automated Engineering Tool (AET) does not have the capability to create these interfaces. Creating an IP Network is necessary for AET to save into an AS or PCT database.

1. Right click the BACnet Interface in the System Tree
2. Select New -> IP Network
3. Enter Name of Network
4. Click Next
5. Enter a Unique Network ID
6. Enter IP address of 10.110.210.1

   This IP address allows the SmartX server to function as an isolated IP network with DHCP server functionality.
7. Click Create

Ensure that the Latest AET Templates are Downloaded

The most current SmartVAV template wizard can be found in the AET Library Manager

A. Download Template Wizard

1. Open AET
2. From the menu, select Tools → Library Manager → Download Library
3. Use the Advanced Search with Country selection to filter for the US market
4. Right-click on the “VAV.001_MP# “ line item and select Download
5. Click Download

B. Download Support Files

Support files may include functional specifications, configuration files, VAV schedule examples, etc.

1. Open AET
2. From the menu, select Tools → Library Manager → Download Library
3. Search for desired library
4. Right-click on the desired library and select Download
5. Select desired Support File and click the download icon to the right of the drop down.

   The support files are listed in the drop-down menu. The download icon will only download the support file shown.

Software Engineering Using the Automated Engineering Tool (AET)

A. Review VAV Schedule

Using the enhanced duplication feature in AET allows the user to duplicate, modify parameters and rename objects, devices and texts using a standard VAV schedule. To ensure the most efficiency with the SmartVAV process, the VAV schedule must be accurate. Use the following guideline to verify your schedule.

1. Choose the MPV VAV Box Schedule as prepared by the Hardware Design engineer
2. Verify that the Controller Names and BACnet names are unique
3. Verify that all box sizes are correct
4. Verify that all airflow setpoints are correct
5. Verify that all other general text is valid
6. Enter BACnet Object IDs (optional)

B. Launch AET and run the SmartVAV Wizard (VAV.001_MPV#.db)

The MPV SmartVAV Wizard provides the user with the Universal MPV SmartVAV application. Use this wizard to create one or more VAVs with MP-V-# controllers.

1. Open AET
2. Select Open Template
3. Browse to SmartVAV Wizard (Templates Folder)
    - Select VAV.001_MPV#.db
4. Select OK
5. Select the Enhanced Duplication option. This option allows the user to duplicate the VAV application while renaming devices and objects as well as setting the addressing configuration
6. Click Next
7. Answer remaining questions based on the hardware design
8. Complete entry of global parameter data
    - A miscellaneous page is available to the user that will add global data such as VAVOccCmd and AhuSaTmp objects as well as offer VAV summary graphics. Check these options if these objects do not currently exist within SBO
9. Verify selections in the wizard summary page
10. Click Finish
11. Upon completion of the wizard, you will be prompted to select the enhanced duplication files. The two required files are the VAV Schedule (.xlsx) and the Configuration File (.xml). The standard configuration file and schedule template are located in the Enhanced Duplication folder
12. Confirm the quantity of controllers to be duplicated and Click OK

    Note: AET will begin to create the controllers and load them into the AET workspace. This may take some time to complete depending on the quantity of VAVs being created
13. Upon completion, review the application in the workspace using the Folder View

C. Transfer the AET Workspace into the Server (AS or PCT)

1. Click the "Log on to on EBO Server" icon
    - Select the EBO Release of server
    - Enter server address, username and password
        - If logging onto a PCT v2.0. enter the virtual IP address and the HTTP port number
        - If logging onto an AS, enter the AS IP address
    - Click Logon
2. The server will automatically be highlighted green indicating that the workspace will be saved to that server. If multiple servers are present, ensure that the correct server is highlighted green by clicking on the server then clicking on the Select SBO Server icon
3. Verify the workspace of devices are correct and ready to save to server. A user will not be able to save to server if there are any sync errors between your workspace and the SBO Server. AET will highlight items in red for any conflicts
4. Verify that the BACnet Interface and MSTP Network are labelled properly in the workspace
5. Save to SBO Server by clicking on the Save to SBO Server icon
    - Error checks will be performed on each object and binding. If an error were to occur, the process will be paused to allow the user to view the error or cancel the process. If the user would like to continue past the error, simply click on continue. A checkbox is available to allow AET to run through the save process without pausing at each error. (Note: Once the process is started, the objects will be saved into the server. Cancelling the Save process stops the rest of the workspace from being saved.)

D. Edit and Bind the VAV Summary Graphics

There are several summary graphics that help support the ATB Application. The Miscellaneous Options checkbox in the wizard must be checked to edit these files. It is expected to have one or more groups of these summary graphics per automation server that contains Air Terminal Boxes. Each summary graphic should not exceed 20 boxes per summary, if you have more than this, you should split the boxes evenly across summary graphics. The recommended number of VAVs allowed in each summary is 15.

1. Duplicate the provided summary template to create the appropriate number of summary pages
2. Modify each summary graphic
    - Edit components in summary graphic TGML to reflect the actual controller name
    - Delete any unnecessary rows
    - Use binding templates provided to bind the summary graphic to the MSTP Network. (Binding templates are provided with the SmartVAV template and can be found in the System folder)

Create a Backup of the Database

Off-site programming is the most efficient way to approach any project, whether PCT is used or a portable AS controller. A significant amount of time can be saved by using AET with the PCT since the PCT gives the user the ability to use the laptop's or workstation's processing power over an Automation Server. Once the database has been loaded into the PCT or a portable AS, a backup must be taken to restore into the on-site Automation Server.

A. Create a Backup set of the Automation Server

1. Right-click on the Automation Server and Select Backup from the menu
2. Enter a name for the file
3. Select All Data from the Backup content menu
4. Click Backup

- Note: A backup is created local to the PCT Server

B. Save a copy of the backup set to the hard drive

1. Expand the Automation Server tree
2. Expand the System folder
3. Expand the Backup and Restore folder
4. Expand the Backup sets folder
5. Expand the Local folder
6. Right-click on the backup set and select Save to… from the menu
7. Save the backup set to the appropriate file location
    - This file will be used to restore the on-site Automation Server. The recommended location is on the network device node for the appropriate AS within the Studio360 project. The Map Folder to Drive Letter feature can aid in setting the appropriate location