



SIMPL Windows

Best Practices
Crestron Electronics, Inc.

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Welcome to the Crestron SIMPL Windows Best Practices Guide. This document identifies the best practices for using SIMPL Windows, newer feature descriptions, some troubleshooting tips, and a comprehensive definition of data produced and/or used by SIMPL Windows. For additional information attend Crestron training, or refer to the OnLine Help or SIMPL Windows Release notes.

Data Management

Program Location

In keeping with good file management practice, Crestron recommends keeping SIMPL Windows programs in separate folders. This ensures that when a program is opened proper data is accessed, and when a program is saved or compiled, no other data from another program is overwritten.

To maximize speed and efficiency of SIMPL Windows, store user modules that may only be used by one program in the project folder. The larger the system-wide User Module folders, the longer it will take for the SIMPL Windows Library to load.

Keep VT Pro-e® and Crestron Avia™ programs in folders separate from the associated SIMPL Windows project folder. Putting the name of the device on the VT Pro-e and Crestron Avia project folders can be helpful, as it is good programming practice to keep files associated with a specific software application in folders dedicated only to that product.

Avoid working from a network drive if possible:

- When working from a network drive, make sure to map the drive and that permissions are set for Create, Delete, Read, and Write.
- It is not recommended to work directly from a cloud hard drive, such as Dropbox™.

Archives and Sharing Programs

Always share or move SIMPL Windows programs using SIMPL Windows-generated archives.

If a program contains Smart Graphics® extenders or DSP extenders, the appropriate files (.sgd_ and .dsj_) will be included in the SIMPL Windows archive for the SIMPL Windows program to open. Do not put VT Pro-e or Crestron Avia projects, or their generated output, inside a SIMPL Windows archive. SIMPL Windows import would extract those files to the SIMPL Windows project folder.

Hands off!

Never edit SIMPL Windows data files outside of SIMPL Windows. Beside the high risk of breaking data links, some text editors may cause the files to become corrupt.

Never rename or move SIMPL Windows program files or modules outside of SIMPL Windows.

- Use the **File > Save As** option, or archives, to rename or move a program. This ensures that all supporting files are placed in the new location as appropriate.
- **Exception for backed-up User Modules** — Starting with version 4.10.04, SIMPL Windows gives users the option to back up module files found in both the User and Project folders. This results in the backup file being renamed with ".bak" added to the file extension. To resurrect these module files, the user must rename the file,

however these files should never be edited. Right-click on the file name, select **Rename**, and remove the .bak file extension. **Do not** change the name of the module.

Never edit, rename, or move Crestron Database module files. SIMPL Windows is dependent on the Crestron Database and Device database. Editing, renaming, or moving any of this data can cause unexpected results.

SIMPL Windows Debugging

Opening the SIMPL Windows source file (.smw) in the SIMPL Windows Debugger provides added debugging power by allowing the programmer to mark which signals to watch.

- Toggle a signal's watch status in SIMPL Windows using **Ctrl+W** or via the right-click context menu. The program does not have to be recompiled. Simply save the program and reopen in the SIMPL Windows Debugger.
- Any symbols open in the SIMPL Windows Detail View will display as SIMPL Windows Debugger bookmarks.

Running Multiple Instances of SIMPL Windows

Be careful when running multiple instances of SIMPL Windows while editing programs and modules contained within them. Make sure you are working on the correct module.

The longer multiple instances of SIMPL Windows run, the greater the likelihood there is for smpwin.exe processes to be left running in the background, even after all instances of SIMPL Windows are closed. This may prevent files from being copied, moved, or cleaned up. End these processes via the Task Manager.

Good Programming Practices

To optimize programming organization for projects with a large code set, use subfolders in a SIMPL Windows program organized by functionality. Use **Alt+S** to add a new subfolder under the currently selected node.

SIMPL+® and Symbol Naming

- Avoid using the `#SYMBOL_NAME` directive in SIMPL+ because SIMPL will use this name as the symbol instead of the file name. If a symbol is named the same as other user modules or SIMPL# name spaces, it can sometimes cause hiccups. Let the symbol name default to the SIMPL+ file name.
- Do not name SIMPL+ modules the same as SIMPL# namespaces. This can sometimes generate false "Function Out Of Scope" compile errors.
- Do not immediately declare a class variable after the `#USER_SIMPLSHARP_LIBRARY` directive if the user .clz library namespace partially matches the name of the library. This can sometimes generate false "Function Out Of Scope" compile errors.

Signal Naming

- Use basic programming principles — [Device/Symbol][Function][Algorithm][Step]

Example:

```
[TP01][Lights][Presets][1]  
[IL][Lights][Preset][1][Fb]
```

Note that the use of brackets works really well with the Search and Replace operations.

- Using "//" signals and using "/" as signal prefixes —
 - The signal "/" and using "/" as a prefix to a signal are different things. That is, "//foobar" is a valid signal that could change state, but "/" is not. For example, adding "/" as a prefix to a signal on the output of one symbol and adding "/" to the input of another symbol are legitimate signals that will connect those two signals together if the original signal names were already connected. This can be used to temporarily disable or isolate a particular connection between two symbols, leaving the other connections from the original signal in place.
 - The best way to "comment out" an input or output is to place a "/" on that item.

Resolving Signals That Have No Driving Source or Destination

Before compiling the program, enable the display of unconnected signals in different colors, using **Preferences > Program Editing > Display signal connection status**.

- The Symbol Detail Views should now show unconnected signals in the defined colors.
- Starting with SIMPL Windows version 4.10.04, expand the Signal List in the Program Tree and select the filter(s) to show only unconnected signals. The Signal List now shows only those signals with connections that need to be resolved.

Smart Graphics and DSP Data Management

It is up to the user to ensure the .sgd and .dsj files are available before refreshing or updating the Smart Graphics or DSP extenders in a SIMPL Windows program.

- If the .sgd location changed from where it was when last imported, use the Smart Graphics Management dialog to point to the new location.
- If the .dsj location changed from where it was when last imported, use the **Change DSP Symbol Export File** context menu option to point to the new location.

Modifying Code

When modifying code, create your own subsystem folder in the SIMPL Windows Program Tree, and "comment out" the old code first. Do not delete the old code until you have properly verified that the new code is working.

Helpful Features

System Configuration Tree

Use the F8 key (or select the **Hide Unused** option in the System Configuration Tree context menu) to show or hide empty slots under the currently selected node.

NOTE: SIMPL Windows only remembers the "Hide Unused" state at the Control System level.

Use the F7 key to toggle the collapse/expand state of the current node.

Double-click the System Configuration Tree to quickly add devices. (This avoids having to weed through the Device Library Tree.) **Shift**+double-click to add multiple copies of a device. Double-clicking on most adapter cards or empty slots will display the "Select New Device" dialog with a list of all Crestron devices that may be added to that location.

Right-clicking on most adapter cards or empty slots will display the context menu with an **Add multiple copies of device to...** option. Select this option to display the "Select New Device" dialog with a list of all Crestron devices that may be added to that location, along with a prompt for adding the number of instances.

Device/Symbol Upgrade Assist

Upgrade Assist is a new feature that helps users upgrade any released device (or symbol) that has been updated in Device Database releases. On program launch, a dialog appears if SIMPL Windows senses any items in the program that have newer definitions in the current database. This dialog replaces Error Log messages after program launch that require users to replace each device listed in the log.

Better User Data Management

As of SIMPL Windows version 4.10.04, there is a new feature that helps users resolve issues when there are user module files with the same name in both the associated user folder and project folders. This feature is enabled by selecting the **User Data Management Support** option in the dialog accessed via **Options > Preferences > General**.

- **Program Launch** — If multiple copies of any user module file are found in both the project and associated user folders (even if the module is not in the program), the "Resolve Module File Locations" dialog is displayed. This allows the user to back up one of the files by renaming it to <filename>.bak. This replaces the Error Log message for each module where two copies were found. The user is notified that the file in the project folder would be the active symbol. The user can now choose which file is active.

NOTE: To resurrect the backed up copy, the user must remove the ".bak" extension. This is the only situation where users should manually rename files.

- **Import Archive** — When "User Data Management" is enabled, the user can select the folder (user or project) into which each module and IR driver is imported. The new import archive dialog also uses tool tips to show what happens if a file is imported to the selected location (for example, if the file would overwrite an existing file, or create an issue with duplicate modules, etc.). After the import is complete, the user is also informed if a user module file or IR driver is found in both the project and associated user folders. (See "Program Launch" above.)

Symbol Detail View

Signals

- **Connection Status** — Select **Options > Preferences > Program Editing > Display Signal Connection Status** to quickly identify (in the Symbol Detail View and in the Signal List) which signals still need connections. This can be handy just before compiling.
- **Faster Signal Naming** — Select **Options > Preferences > Program Editing > Enable Signal Completion Aid** to use "intelligent sensing" to show signals with similar names as they are being typed.

Symbol Detail Window Management

The last three buttons on the right of the toolbar allow control of the Symbol Detail window.

- **Limited Symbol View** — To control the maximum number of symbols that appear in the Detail View:
 - Display the maximum number of symbol windows in the Detail View to see at any one time. When the maximum number of symbols are open, click the "Limited Symbol View" toolbar icon.



SIMPL Windows takes note of the number of symbols showing. If any more symbols are opened, the first displayed symbol will close ("First In, First Out").

- To clear the limit on the number of symbols displayed, click the "Limited Symbol View" toolbar icon again to deselect it.



- **Pinning a Symbol** — To mark any symbol to always show in the Detail View (to "pin" a symbol), even when a selection is made to close all symbol details:
 1. Click on the symbol window to pin.
 2. Click the push pin toolbar icon.



- **Clearing Detail View** — Clear the Symbol Detail View (except for pinned symbols) by clicking the "Close All Symbol Details" toolbar icon.



Crestron Application Market Access

The Application Market website can be accessed from the SIMPL Windows Symbol Library. In some cases, downloaded files might need to be prepared for use by SIMPL Windows.

- If the file is a SIMPL Windows archive, it can be imported into SIMPL Windows from the **File** menu.
- If the file is an archive containing SIMPL Windows and non-SIMPL Window files:
 - Extract the files to a folder and evaluate the contents.
 - A SIMPL Windows archive may be inside the downloaded data. If so, import into SIMPL Windows.
 - If .smw, .sgd_, .dsj_, .umc, .ush, .usp, or .clz files are in the downloaded data outside of a SIMPL archive, put those files in a separate folder, which should then be referred to as your Project Folder.

NOTE: User modules can also be placed into the appropriate SIMPL Windows User Module folder (defined in SIMPL Windows via the **Options > Preferences > Directories** dialog).

- If there are VT Pro-e projects and compiled outputs in the downloaded data, place those in a folder separate from the SIMPL Windows project folder.

Troubleshooting

Before reporting issues to Technical Support:

- Collect **Help > About** information.
- Provide a Program Archive if the issue can be reproduced.
 - <program>_archive.zip is created on **Save** if the option is enabled.
 - <program>_compiled.zip is created on **Compile** if the option is enabled.
 - The "Create Archive" dialog allows the user to add extra files to the archive if desired.
- Document the steps to reproduce the issue.

Always run SIMPL Windows as an Administrator:

1. Right-click on the **smpwin.exe** file and select **Properties**.
2. On the **Compatibility** tab, select **Run this program as an administrator**.

Hangs and Exceptions

If there are SIMPL Windows startup problems or file access errors, try the options below. Some computer configurations and third-party applications have been known to sporadically interfere with SIMPL Windows.

- Turn off User Access Control (UAC)
- Disable Windows® operating system indexing on the SIMPL Windows project folders (**Control Panel > Indexing Options**).
- Disable antivirus and malware protection software if possible (to see if this solves the problem).
- Uninstall NVIDIA® GeForce® drivers (which are known to conflict with some other software products).
- Uninstall PowerBroker® for Windows. (Also remove or rename C:\Windows\sysWOW64\btpload32.dll.)
- Uninstall Windows SearchQu Toolbar. (This is an adware program that causes browsing redirects. Its dll sometimes conflicts with SIMPL Windows.) If SearchQu Toolbar was installed, go to C:\Program Files (x86)\Windows SearchQu ToolBar\Datamngr and remove (or rename) the datamngr.dll file.
- Determine whether there were recent Windows updates. If so, were they installed around the same time the issue arose? If so, try uninstalling.
- If working on a network, try to reproduce the issue on a local drive. Also, always map network drives.

Data Integrity

Most data integrity errors are due to file corruption. Some text editors can corrupt a file, as can some email programs or source control software, which is why Crestron strongly discourages editing SIMPL Windows files outside of SIMPL Windows.

Sometimes copying or emailing a file can introduce file corruption. Always use SIMPL Windows archives to share and copy programs.

SIMPL Windows Data

Program-Related Data Produced and/or Used by SIMPL

Program Files

File Type	Definition	Produced by SIMPL?	Used by SIMPL?	Required by SIMPL?	Notes
.smw	SIMPL program source	Y	Y	Y	
.sm2	Copy of .smw before the latest save	Y	N	N	May be useful for user error recovery or tech support troubleshooting
.asv	Autosave file	Y	On demand	N	
.smw.err	Copy of .smw if data integrity error is found on launch	Y	N	N	Used by Crestron's development team for program recovery

User Module Files

These are SIMPL, SIMPL+, or SIMPL# modules created by the user. They are read into the SIMPL Symbol Library if files are present in the appropriate user and/or project folders.

- **User Module** — File(s) must be located in the user-defined "User Module" folder (via **Options > Preferences > Directories**). They will be available to all programs.
- **Project Module** — Files located in the project folder. They will only be available to the program, or other module, in the project folder.

File Type	Definition	Produced by SIMPL?	Used by SIMPL?	Required by SIMPL?	Notes
.umc	SIMPL user module	Y	Y	On demand	
.um2	Copy of SIMPL user module before the latest save	Y	N	N	
.usp	SIMPL+ user module source file	Y	Y	On demand	
.ush	SIMPL+ user module compiled header	Y	Y	On demand	
.clz		N	Y	If referenced by SIMPL+	

Smart Graphics Data

File Type	Definition	Produced by SIMPL?	Used by SIMPL?	Required by SIMPL?	Notes
.sgd	VT Pro-e Smart Graphics compiler output of Smart Graphics extender definitions	N	Y	On import	Defines the Smart Graphics extender symbols, imported into SIMPL Windows programs and associated with touch screen instances
.sgd_	Captured copy of Smart Graphics extender definition upon import or refresh in SIMPL Windows	Y	Y	Y	Required to open the SIMPL Windows program, this is a copy of the .sgd file that was imported into SIMPL Windows. This ensures that no matter what updates the VT Pro-e compiler might make to the original .sgd, SIMPL Windows will always be able to open the SIMPL program without forcing the user to update or refresh their Smart Graphics extenders. Do not edit, move, or delete these files.

DSP/Crestron Avia Data

File Type	Definition	Produced by SIMPL?	Used by SIMPL?	Required by SIMPL?	Notes
.dsj	Symbol export file from Crestron Avia tool	N	Y	On import	Defines the DSP controls exported into SIMPL Windows as a "DSP Custom Symbol"
.dsj_	Captured copy of Crestron Avia symbol export upon import or refresh in SIMPL Windows	Y	Y	Y	Required to open the SIMPL Windows program, this is a copy of the .dsj file that was imported into SIMPL Windows. This ensures that no matter what updates the Crestron Avia tool might make to the original .dsj, SIMPL Windows will always be able to open the SIMPL program without forcing the user to update or refresh their DSP data. Do not edit, move, or delete these files.

Archives

At the time of archive creation, SIMPL Windows archives contain, at a minimum, all files required for the program to open.

File Type	Definition	Produced by SIMPL?	Used by SIMPL?	Required by SIMPL?	Notes
<name>.zip	User-initiated SIMPL archive	Y	Y	N	User-initiated via the File menu
<program name>_archive.zip	Archive created on program or module save	Y	Y	N	Must have Archive Programs On Save or Archive SIMPL Modules On Save enabled in Options > Preferences > General
<program name>_compiled.zip	Archive created on program compile	Y	Y	N	The most comprehensive archive, it contains the program source and files, as well as compiler outputs. The option to create the archive on compile must be enabled in Options > Preferences > Compiler Settings .
.arcv	Archive manifest file	Y	Y	N	Internal file used by SIMPL. Do not touch.

Module Backups

With SIMPL Windows version 4.10.04, there is new support for managing duplicate modules (modules found in both the user and project folders). The user has the option to create a backup of the module they don't want to load into the Symbol Library.

User-requested module backups (via the "Resolve Module File Locations" dialog) are left in the original folder. The user can choose to remove the ".bak" extension to put a module back into play.

File Type	Definition	Produced by SIMPL?	Used by SIMPL?	Required by SIMPL?	Notes
<module>.<type>.bak	User-requested backup copies of modules found in both the user module folder and the current project folder—SIMPL appends ".bak" to the selected filename	Y	N	N	

Compiler Outputs

File Type	Definition	Produced by SIMPL?	Used by SIMPL?	Required by SIMPL?	Notes
.spz	2-Series container that holds all compiled output used by the control system	Y	N	N	.zip file
.lpz	3-Series® container that holds all compiled output used by the control system	Y	N	N	.zip file
.bin	Binary output	Y	N	N	
.dip	IP table	Y	N	N	
.bt	Boot file	Y	N	N	
.sig	Signal file	Y	N	N	
.rte	Route file	Y	N	N	
.cpz	SIMPL# Pro	Y	N	N	
.ird	IR resource file	Y	N	N	
.fp2	Symbol mapping	Y	N	N	
.rvi	RoomView® information	Y	N	N	
._bacnetconfig.xml	BACnet® config	Y	N	N	
.dsc	Discovery file	Y	N	N	
.mft	Manifest file	Y	N	N	
._crosspointlist.txt	Crosspoint list	Y	N	N	
.spp	SIMPL+ parameters	Y	N	N	
.cloud	Cloud file	Y	N	N	
.hash	Auto update hash	Y	N	N	
.smft	Auto update manifest	Y	N	N	
SPIsWork	Working folder used during SIMPL+ compiles	Y	N	N	Contains intermediate SIMPL+ compiler files

Configuration Data

File Type	Definition	Produced by SIMPL?	Used by SIMPL?	Required by SIMPL?	Notes
smpwin.ini	Application file that contains SIMPL configuration settings	Y	Y	Y	Do not edit

Database Data Used by SIMPL

Device Database

File Type	Definition	Produced by SIMPL?	Used by SIMPL?	Required by SIMPL?	Notes
iodev.tio	Crestron device model definitions	N	Y	Y	
symlib.tio	Crestron device symbol and intrinsic symbol definitions	N	Y	Y	
*.cfg	Compiler configuration files	N	Y	Y	
include4.dat	Container holding files required by compiler	N	Y	Y	Also contains SIMPL# Pro device drivers

Crestron Database

File Type	Definition	Produced by SIMPL?	Used by SIMPL?	Required by SIMPL?	Notes
.cmc	Crestron SIMPL modules	Y	Y	Y	Never touch these files. The user can import a Crestron Module into a User Module if desired.
crsmacro.tio	File containing just the symbol definitions of all Crestron SIMPL modules	Y	Y	Y	Used for faster startup time. Do not edit.
crssplus.dat	Container holding all Crestron SIMPL+ modules and Crestron SIMPL# assemblies	N	Y	Y	Never touch these files. The user can import a Crestron Module into a User Module if desired.
cnctrldb2.mdb	Database containing all Crestron third-party devices and logic module associations for Crestron devices	N	Y	Y	
crestldb.zip	Container holding all Crestron IR driver files	N	Y	Y	
.pdf	Help files for Crestron Modules	N	Y	Y	

SIMPL#

File Type	Definition	Produced by SIMPL?	Used by SIMPL?	Required by SIMPL?	Notes
.cpz	SIMPL# Pro program	N	N	N	
.clz	SIMPL# library	N	N	N	
.cplz	SIMPL# Pro library	N	N	N	

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