MSI SolidWorks Control Panel Design
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Section 1, Introduction:

1.1 Description:

The MSI Controls Library is not just a collection of component files but forms a "system" to assist in the effective design of Control Cabinets and is an economical alternative to other Controls Design Packages and Add-ons.

1. Other than these instructions, 100% of the MSI Controls Library is built around standard Solidworks commands, making the Library easy to learn and use.
2. MSI electrical components are "simplified" shapes which allows for determining the physical relationships and spacing within Control Cabinet designs while minimizing file sizes.
3. MSI "simplified" component files can be copied and with minor modification can be transform into new component files.
4. MSI Control Library components extensively use design tables. When components are physically similar, new part numbers can easily be added into the library by editing the design tables. Instruction for extending the Controls Library are presented in Section 4.
    (Contact MSI for availability of additional Control Library components or to request specific components).
5. The custom property, "Description" is incorporated into all MSI electrical library components, saving time and promoting accuracy as Bill of Materials (BOM's).
6. Incorporation of Mate References for most components greatly enhances the efficiency of the MSI Controls Library. Components are designed to "snap" onto din rails, or various surfaces of control cabinets where they can be easily positioned into Control Cabinet Assemblies.
7. Appropriate MSI components include Smart Features that provide for the automatic placement of holes and cutouts into the surfaces of control panels. Library Features are provided for the mounting of components like 22.5mm Push Buttons and Lights.
8.   Manufacturer Data Sheets, Catalogues, and PDF manuals are linked to most MSI Control Library components for easy reference. These links allows for technical information to be easily found and used during the design process. They also enhance the ability to add new part numbers when needed. Some hyperlinks to web locations.

The MSI Controls Library is not exhaustive but creates a foundation for building your own custom Solidworks library. This approach allows for a quick start and as your custom library is built it becomes your companies default standard of components that are reliable, available, and reasonably priced. (Appendix C is a brief summary of component types and their location.)

In summary, the goal of the MSI Library is to provide a competitive solution for the efficient development of 3D Control Panel Assembly models with Solidworks.

1.2 No special training required:

These instructions describe a few recommended practices that will streamline the design process, but since only standard Solidworks commands are needed, little or no additional special training is needed to use of the MSI Controls Library is necessary.

1.3 System Requirements:

The MSI Controls Library will work with **all** versions of Solidworks that uses standard Design Library components, version 2014 and above.

1.4 The need to verify accuracy:

MSI places a high value on quality, but due to large number of part numbers in the Controls Library, the user must verify all critical information. For a very high percentage of projects, the "simplified" files will have no effect on the design. However, the user should always evaluate if these simplifications are acceptable within all designs.

Note: Decals provide visual effect and help with identifying components but they are not critical for designs. They have been captured from Manufacturers literature and there is no guarantee of their accuracy.

Please contact MSI if you discover any errors, thank you.

1.5 The need to verify availability:

The price and delivery should be verified for all components before use.

1.6 General Comments:

No engineering advice is being offered for designs or for the use and selection of any of the extended library components.

All MSI Control library components use custom "Description" properties to automatically populate drawing BOM's. Description properties may need to be modified or added within the design tables of individual component BOM templates. It is recommended to include a design table column which references the custom property: $PRP@Description

MSI extended library parts follow MSI's general guidelines (Appendix A).

 Please Do Not distribute these directions or MSI Controls Library files:

The user is free to use these components during the course of normal engineering designs. A considerable amount of time and effort has been spent in developing the MSI Control Library. Therefore, the user is asked to respect the End User License Agreement, especially to not to distribute or upload any of the MSI Controls Library component files to websites or to non-licensed users (**please see Appendix B for details of the licensing agreement**).

## Section 2, Getting Started/ Installation of MSI Controls Library:

2.1 Installing the MSI Controls Library:

Step 1: It is recommended to download and open this file into a "**C:\2014 MSI Controls Library**" directory. (Note: This directory is not mandatory. The library files are 2014 but can be copied into later versions of Solidworks.)

The "**Data Sheet.exe**" should also be downloaded**.**

The "**MSI Control V1.0.exe**" file will need to be downloaded through the shopping cart.

The resulting directory should be similar as is shown below. (Note: SW 2014 is used as an example throughout this tutorial. Newer versions of Solidworks will need to be modified accordingly):
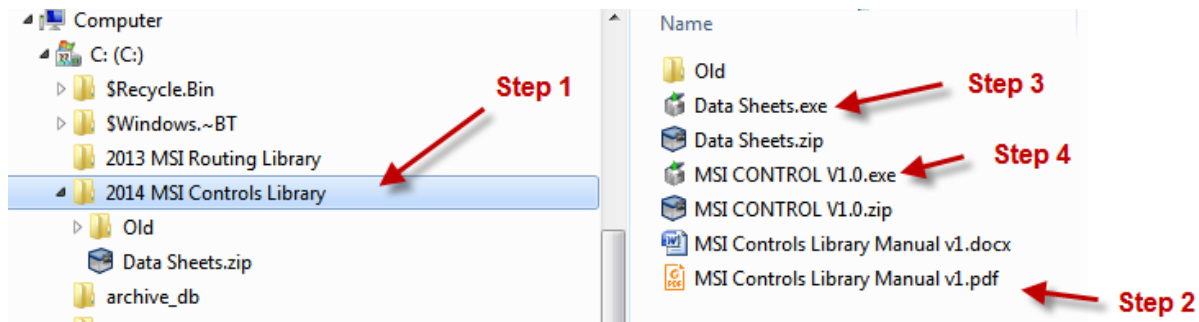
Step 2: This or similarly named PDF file should be opened and followed to complete the installation.

Step 3: Double Click on the "**Data Sheets.exe**" file which will begin the Unzip process. It is important to download the data sheets into the "**C:\Data Sheets**" directory. If the Data Sheet files are not located in this directory location, the Data Sheet references in every part file will be broken.

Step 4: Double Click on "**MSI Control V1.0.exe**" file which will begin the Unzip process for the MSI Controls Library. When the dialogue box opens, verify that the "Extract to" location is correct. This directory can be (probably should be) within your latest version of SW, such as **C:\Solidworks 2014\Design Library\Controls** or any other appropriate location. Wherever location is chosen, that directory will need to later be added to the Design Library. (See section 2.2 below for further details).

MSI has followed the practice to place all Design Library Part files under the various version directories. As an example for SW 2013, the directory would be something like: **C:\SolidWorks 2013\design library\Controls.** As an example for SW 2014, the directory would be something like: **C:\SolidWorks 2014\design library\Controls.** This practice prevents "cross contamination" of files between newer and older versions of Solidworks.

Note: There is no restriction on the location of where the Design Library can reference the MSI Controls Library files. However, if the location of the MSI Controls Library is changed after some of the components have been used within designs, it will be necessary to manually relocate each of the components for every project.

Section 8, Appendices:

Appendix A, MSI Library Rules:

1. Whenever reasonable part files should include multiple configurations of parts.
2. Design Tables should be used and a "Description" column for automatically filling in Bill of Material tables ($PRP@Description).
3. The Custom Description Property is useful to identify if a part file is a single part or if it includes a number of configurations.
4. PDF's with catalog and or critical design information should be noted or linked in the Design Journal.
5. To allow for efficient use of library parts, the number of components per family should be kept in groups of about 20 components.   Thus eliminating excessive scrolling. Where it is appropriate for assemblies to be in the library, all parts that are not usually individually used should be placed into a sub-folder under the "parent" folder. The number of parts in the "Parts" folder may be more than 20 since these individual parts are not commonly used.

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Appendix C, Summary Description of Directories and Component files:

Allen Bradley- Approximately 30 types of 22.5 mm lights and push buttons.

Circuit Protection- ABB Main Disconnect Switches, actuators and Rods.

Contactors & Motor Control- Minarik DC drives, ABB Contactors, ABB Motor Drive, and other miscellaneous components.

Hoffman- Various Consoles, Push Button enclosures, and C-SD enclosures.

Instrumentation- Signal Conditioners, Watlow Controllers, Keyence Counter, and other misc controllers.

Misc.- Various ID Tags, Legends, Panduit, Din Rail, Cord Assemblies, Cord Restraints, and other misc. components.

PLC- AB 800 Series PLC' and related modules, Keyence KV series PLC's, Mitsubishi FX2n series PLC's, Siemens S7-1200 series PLC's and components and other related components.

Power Supply- 24 VDC, AB Surge Protector, GE Transformer, Islatrol module and other misc. components.

Relays- AB Interposing Relays, CH Relay, AB 3PDT relay with base, CH 2PDT relay with base, Crydom SSR

Safety Modules- A number of Banner Safety Relays.

Stepping Motor Controllers- Anaheim Automation Controllers, Drivers, and Transformer.

Terminals & Fuses- A number of Entrelect Fuse Holders, fuses, Din mounted CB's, a number of Entrelect terminals and related components.

VFD's- AB PowerFlex 523, 525, and 527, ABB ACS355, and Siemens G120C series.

Note: Not all configuration for every component/ series has been implemented.

Appendix D, MSI Simplified Component Files:

Unlike many mechanical components where many of the features may be important within designs, the mechanical aspects of Control components are considerably less.   In many cases MSI Control Library components are functionally a block.   The dimensions of the components are important, but what is more important are the descriptions that automatically populate the BOM's.

Note: A large percentage of MSI Control Library components have a decal. The purpose of the decal is to allow easy identification of the components. However, many of these decals have been captured from various web sources and it is important to understand that there is no guarantee of their accuracy.