

The information below serves as instructions for using an automatic documentation (AutoDoc) tool developed by MotoTron Corporation. For additional questions beyond the scope of this document, bug reporting, or feature requests, please contact:

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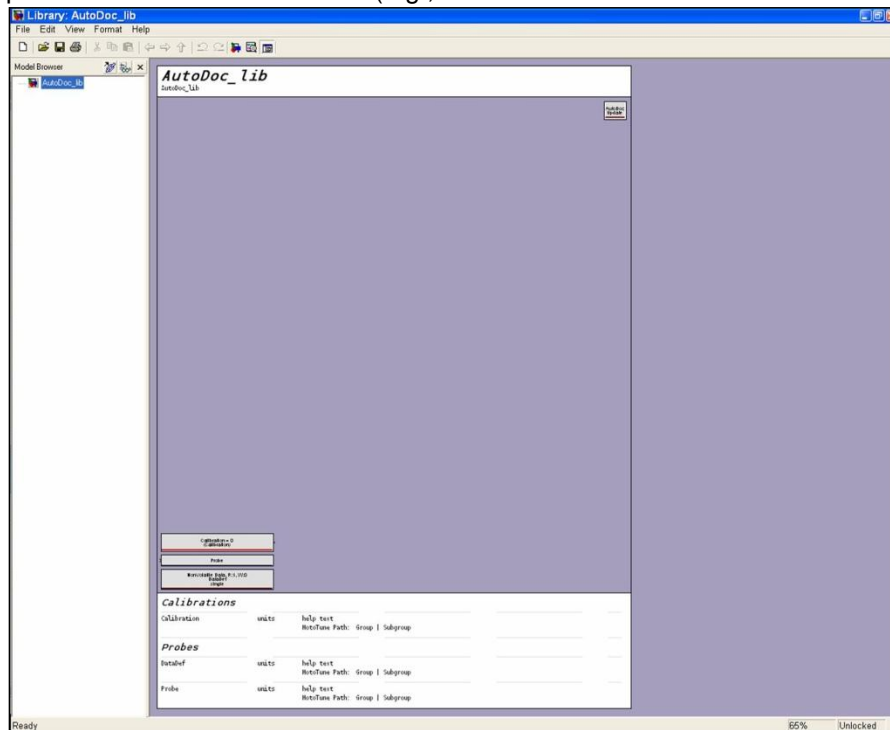
## OBJECTIVES OF THE AUTODOC TOOL

There are two primary objectives of the AutoDoc tool:

- To provide a means of creating effective and formatted documentation directly in the Simulink model.** The AutoDoc tool allows the user to write objective, description, and equation text that will appear directly in the Simulink model. Additionally, the AutoDoc tool displays details (such as units, help text, and MotoTune group) of calibrations and probes for a given model path page.
- To assist the user in creating effective documents outlining their Simulink model.** A tool cannot be expected to provide a complete piece of documentation, as documentation requirements can vary greatly from one project to another. Instead, the AutoDoc tool assists in documenting the peculiar nature of a Simulink model by capturing screen shots of the model (that can be easily inserted into Microsoft Word, for example). Further, the AutoDoc tool automatically generates a table of contents that correlates with these screen shots and also creates a calibration-probe summary in Microsoft Excel.

## INSTRUCTIONS FOR USE

- Copy the AutoDocTool folder onto the model path.** Place the AutoDocTool folder somewhere on the MATLAB path of the model (e.g., the Libraries folder of the current project directory).



2. **Open the AutoDoc library.** Open the AutoDoc\_lib.mdl library file (Figure 1) from the AutoDocTool folder.

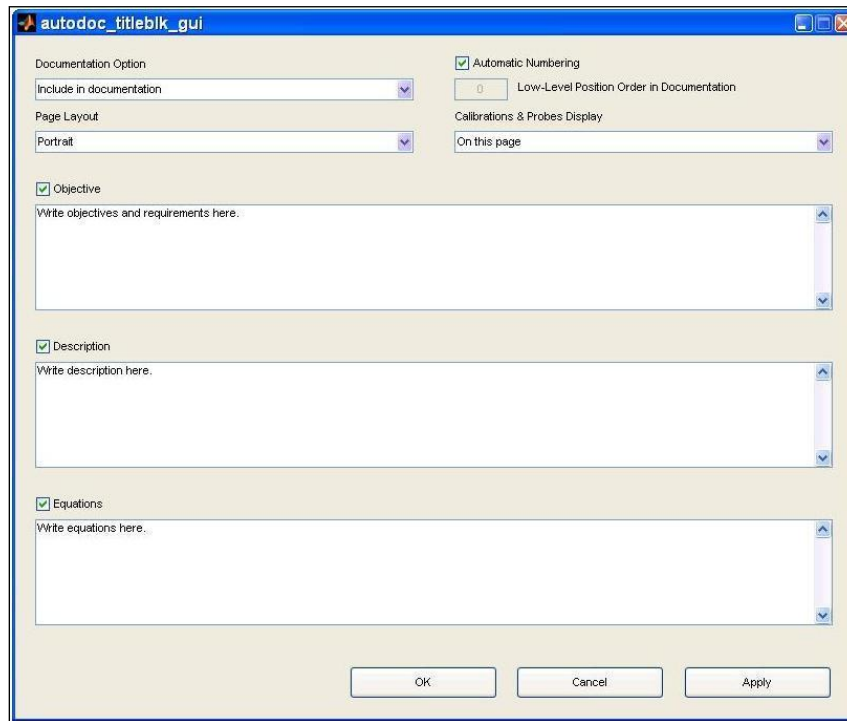
**Figure 1: AutoDoc\_lib library file**

3. **Insert the motohawk\_autodoc block into the Simulink model.** Follow steps 3 and 4 for each model path page desired to have documentation. From the AutoDoc\_lib.mdl library file, copy the motohawk\_autodoc block (Figure 2) and place it into the Simulink model.



**Figure 2: motohawk\_autodoc block**

4. **Choose title block options.** Double-click the motohawk\_autodoc block to load the AutoDoc blocks onto the screen. Then, double-click the title block to see the graphical user interface (as in Figure 3) and refer to the following regarding the options.



**Figure 3: Title block GUI**

- **Documentation Option:** *Include in documentation* indicates that this model path page will be captured as a screen shot and in the table of contents; additionally, the path will be given a documentation number (e.g., 2.1.2.5). *Exclude from documentation* means that the model path page will not be captured as a screen shot (documentation is only intended to be seen in Simulink).

- **Automatic Numbering:** If this checkbox is selected, the documentation number will be automatically assigned based upon that subsystem's physical position relative to other others on the same level (i.e., with the same parent path). If unselected, the **Low-Level Position Order in Documentation** allows the user to explicitly specify this subsystem's desired order in the documentation. Note that these options are only relevant if *Include in documentation* is chosen for the Documentation Option.
  - **Page Layout:** Choose *Portrait* or *Landscape* such that the model blocks best fit within the documentation boundaries.
  - **Calibration & Probes Display:** The *On this page* option displays calibration and probe data at the bottom of the model path page. *On separate page* displays calibration and probe data on a separate page and should be chosen if space limitations prohibit displaying the data on the same model path page as the model blocks.
  - **Objectives, Description, & Equations:** Write objective, description, and/or equation text as desired. Objectives and Description text can include LaTeX commands for italic or bold face font formatting (`{\it}` and `{\bf}`, respectively); line spacing is determined through an internal function and thus explicit `\newline` commands do not have to be specified. Equations text should use LaTeX commands for equation formulation (e.g., for subscript, superscript, Greek letters, etc.); in this case, `\newline` commands should be explicitly used to specify new lines.
5. **View and/or update AutoDoc blocks by double clicking the motohawk\_autodoc block or through motohawk\_autodoc\_load.** Double clicking the `motohawk_autodoc` block will load and/or update the AutoDoc blocks (title block, right-left borders, and calibration-probe display) on the current model path page. Running the `motohawk_autodoc_load` function will load and/or update the AutoDoc blocks throughout the entire model. Execute through the following syntax:
- `motohawk_autodoc_load` loads and/or updates AutoDoc blocks in the `bdroot` model.
  - `motohawk_autodoc_load('ModelName')` loads and/or updates AutoDoc blocks in the explicitly specified `ModelName.mdl` model.
6. **Close the AutoDoc blocks through motohawk\_autodoc\_close.** Running the `motohawk_autodoc_close` function will close (i.e., delete) all AutoDoc blocks throughout the entire model. For instance, this function may be used before a model update (CTRL+D) on a large model to mitigate any contribution from AutoDoc blocks to long update times. Execute through the following syntax:
- `motohawk_autodoc_close` closes AutoDoc blocks in the `bdroot` model.
  - `motohawk_autodoc_close('ModelName')` closes AutoDoc blocks in the explicitly specified `ModelName.mdl` model.
7. **Capture screen shots, create table of contents, and produce and calibration-probe-fault summary through motohawk\_autodoc.** The `motohawk_autodoc` function has 3 main products:
- **Screen shots:** Model screen shots are placed in the "Current Project Directory"\AutoDoc\_ModelName folder (note: delete old files from this folder before every `motohawk_autodoc`). Without the file extension designation being shown, sort according to name (in alphabetical order, the files are in the correct order) and insert all files at once into Microsoft Word; make sure the first page is the same as the designated StartPg. The screen shots should automatically fit one on a page.
  - **Table of contents:** A table of contents file is created in the "Current Project Directory"\AutoDoc\_ModelName folder. The formatting may look odd initially; to fix, format all text to a font of Arial, size 10 and change the left and right page margins to the standard 0.5". The first page number in the table of contents will be StartPg (default is 1 if StartPg is not explicitly specified).
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- **Calibration, probe, and fault summary:** The summary is created as a Microsoft Excel file and is placed in the "Current Project Directory"\AutoDoc\_ModelName folder. If desired, copy the cells and insert into the Microsoft Word document (as an appendix, for example). Note: a summary will not be created for library models.

Execute through the following syntax:

- **motohawk\_autodoc** runs the AutoDoc functions on the bdroot model; StartPg is set to 1.
- **motohawk\_autodoc('ModelName', 'p1', v1, 'p2', v2)** runs the AutoDoc functions on the explicitly specified 'ModelName' model and also sets parameters of the process:

Parameter (p)	Value (v)	Description
'AutoFill'	'on'	Places a motohawk_autodoc block on each model path page in 'ModelName' (if not already present)
'StartPg'	StartPg	Sets first page number in table of contents to StartPg

For example, the command `motohawk_autodoc('EngineController', 'AutoFill', 'on', 'StartPg', 32)` would fill the EngineController.mdl file with motohawk\_autodoc blocks, run the AutoDoc process, and set the first page number in the table of contents to 32.

The purpose of creating the AutoDoc products independently is to allow the user the freedom and flexibility to insert the information into their documentation in any way he/she desires. A recommended practice is to create a formatted documentation template; the table of contents, screen shots, and calibration-probe-fault summary can then be inserted into the template to quickly reproduce documentation at each software release.