Graphical Microcontroller Software Development System Flow Chart Engine

Abstract

The flow chart engine and methods used by a graphical software development system for microcontrollers is described. Novel techniques and algorithms within the flow chart navigator, editor and bi-directional conversion sub-systems are highlighted. The flow chart navigator engine sub-system gives a tree structure-based representation of the multiple level flow chart and serves to enable the user to easily inspect the program flow in the various layers of the flow chart. The assembly code to flow chart conversion engine sub-system converts assembly codes, which can contain constructs of commonly used languages, such as the C language, into a hierarchical flow-chart. Several assembly languages are supported. Various mechanisms are available in the sub-system to ensure that the flow chart created will be logical and understandable. The transformation of the flow chart into text-based codes is handled by a flow chart to assembly codes conversion engine sub-system. The flow chart editing engine sub-system provides the user with various graphical editing tools to modify the flow chart. New shapes and lines are easily inserted, including functions. The text within the shapes can be edited on screen. Existing shapes can also be re-sized and re-located. These tools are specially tailored for microcontroller software oriented flow charts. Flexibility and robustness has been built into the above sub-systems to address assembly programming realities.

FIG. 1

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