

CONNECTORIZER

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1 INTRODUCTION

A small code was created to accomplish system connections in LEAPS databases. It operates directly on a LEAPS database and provides system connectivity between components, creating appropriate FOCUS-compliant structure.

2 BACKGROUND

The Navy's data repository for ship design is the Leading Edge Architecture for Prototyping Systems, or LEAPS. The structure, background and use of LEAPS are described in the LEAPS Editor Users' Manual [1]. The product meta-model that describes the proper storing of ship data in LEAPS is termed FOCUS; the storage of systems within FOCUS is described in detail in [2].

The computer code described herein is designed to connect components into a system in a FOCUS-compliant manner, and creates the necessary structure if not already extant.

This code used the GSViewer, Copyright NSWCCD 2006, as a starting point, but removed most of the GSViewer functionality; the GSViewer code was used to create the Windows GUI.

3 FUNCTIONS

The file functions are self-explanatory. The LEAPS definition of terms can be found in the LEAPS User Manual.

File:

1. Open database. Opening a database automatically runs the study and concept selection code. Note: the file path and file name must be typed into the popup dialog box. The default can be changed within the source code, in the DialogDataWrapper constructor in DialogDataWrapper.cpp.
2. Select study.
3. Select concept.
4. Close database.

System:

1. Check number of ports on components. This function interrogates all the components in the active concept and prints a list of the components, using their descriptive names, with the number of ports in parenthesis afterwards.
2. Connect two components. This function prompts the user to select two components, then creates all the appropriate linkages between them and adds them to an electrical system diagram. There are two options: create new port/terminal pairs or use existing open terminals.
 - a. Create new port/terminal pairs. This option creates a new port associated with each component, creates a terminal and port/terminal linkage for each new port, then creates an exchange connection between the terminals. It then creates a component exchange connection (using the two components and the exchange connection). After creating a minimal electrical system structure if none exists, the program prompts the user to select a system to which this connection is added. It then finds the associated system diagram or creates it as necessary, finds the

root connection or creates it as necessary, and adds the component exchange connection to the root connection.

- b. Using existing free terminals. This function programmatically finds two unconnected terminals and creates a linkage between them, then finds or creates the appropriate system structure including component exchange connection, system connection, diagram and system, as accomplished in part a. above, and creates the proper associations. Note that there is no control over which terminal it selects – the program uses the first open terminal on the component that is found.
3. Add terminal to a component. This function has two options: either create a port and terminal or add a terminal to an existing port, as selected by the user.
 - a. Create new port. This function prompts the user to select a component, then creates a new port and adds it to that component, creates a new terminal, and creates a new port-terminal linkage, linking the new port and new terminal.
 - b. Use existing port. This function prompts the user to select a component, then prompts the user to select a port on that component. It then creates a new terminal, creates a new port-terminal linkage, and links the new terminal to the selected port.

The code is available from MIT Sea Grant, at seagrant.mit.edu.

4 REFERENCES

- [1] Naval Surface Warfare Center Carderock Division, *LEAPS Version 5.0 LEAPS Editor User's Manual*, March 2015. Available with LEAPS distribution.
- [2] Naval Sea Systems Command Carderock Division, *Focus System Definition*, Under Development, Draft Version of 20 July 2015.

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