## Circuit Selection and Information

This section describes the process of loading the desired circuit model from the library and making any subsequent changes to the system configuration. The screenshot of this particular tab can be activated by clicking on the “Circuit Selection” button at the top of the interface as shown in Figure 1-4.

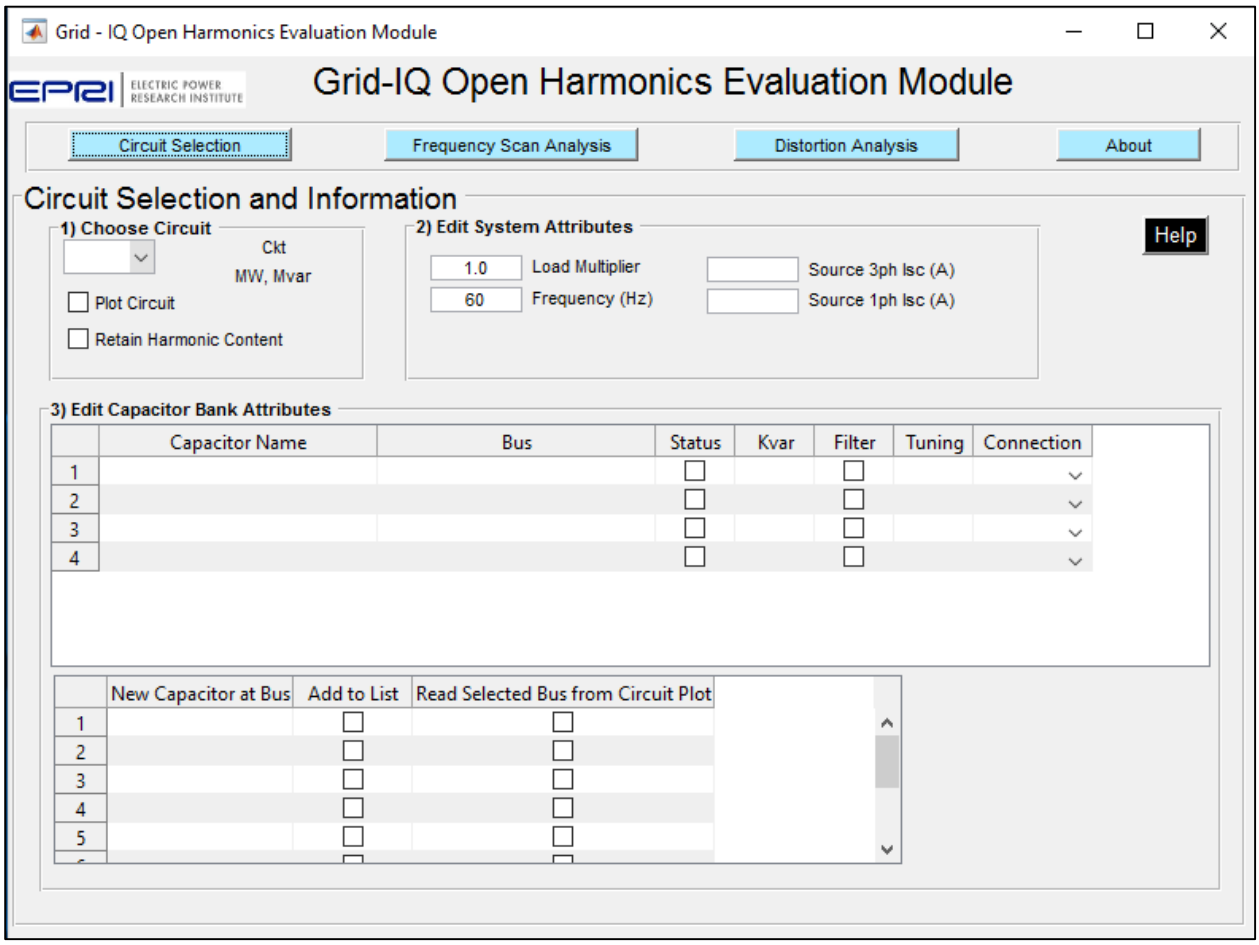


**Figure 1-1**
**Circuit Selection and Information tab**

### *1) Choose Circuit*

The user can load any desired circuit model from a circuit library by making a selection from the dropdown list in “**Choose Circuit**” sub-window. This version of Open-HEM has only “ckt5” in the library and the “8500-Node” IEEE circuit provided as “User Defined” circuit. It is expected users of the Open-HEM” will develop their own set of user-defined circuits. Once a circuit is selected, the module will solve the selected circuit for power flow and automatically populate the fields for active and reactive power. It will also populate the editable fields in the “**Edit System Attributes**” sub-window, and the same are described in the next section. In addition, the top table in “**Edit Capacitor Bank Attributes**” sub-window is populated with information on the various capacitor banks that are connected to the circuit.

Checking the "**Plot Circuit**" checkbox would create the plot representing the physical layout of the circuit primary conductors. It will also identify the location of the feeding substation and the individual capacitor banks. The row number in the upper capacitor table correlates to the location of the bank in the plot by the number of yellow dots. The example plot for Ckt5 is shown in Figure 1-6. Dashed lines represent single- and two-phase line sections. The user must select an element by clicking an element on the feeder for harmonic analysis.

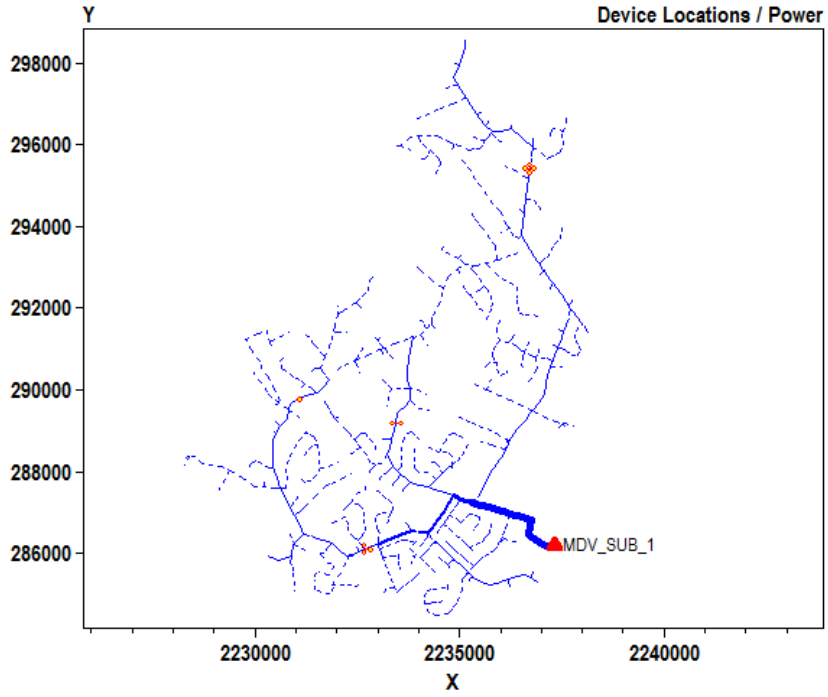


**Figure 1-2**
**Example circuit layout**

In previous versions of the software, any harmonic contact included in the circuit model was not used in order to provide a harmonic-load-free baseline of the system being studied. Checking the "**Retain Harmonic Content**" allows the harmonic content (loads and/or sources) associated with the model to be included in the analysis.

Users can load their own circuit models. The procedure for doing the same is as follows:

1. Structure the OpenDSS model of the desired circuit(s) so that all the relevant OpenDSS files are placed in a folder with desired name <Foldername>.
2. Rename the master file of the model as per the format: "**Master_<Foldername>.dss**".
3. Place a copy of the above folder alongside the other circuit folders in the main folder for HEM.
4. Launch the analysis interface if it is not opened already and select "**Load User Defined**" from the dropdown list under "Choose circuit." A file-selection dialog box will appear on the screen.
5. Select the above folder.
6. The desired circuit should load and be ready for the analysis.

### *2) Edit System Attributes*

The user can edit the following circuit attributes for the loaded circuit:

- Load Multiplier: A global multiplier that gets applied to all the load elements in the model. The default value is 1.0, which can be used for simulating peak loading conditions.
- Frequency (Hz): The system frequency in Hz. The default is 60 Hz for North America.
- Source 3ph Isc (A): The three-phase short-circuit current in amperes at the source node. Note that this value is dependent if the model's source has impedance. Some models represent the source as infinite followed by an impedance element.
- Source 1ph Isc (A): Single-phase short-circuit current in amperes at the source node. See Note above for 3ph Isc.

### *3) Edit Capacitor Banks Attributes*

The following capacitor bank attributes can be edited for the individual capacitor banks on the loaded circuit except for name and bus:

- Status: If checked (default option), the bank is connected.
- kvar: Capacitor bank size.
- Filter: If checked, the capacitor bank is configured as tuned filter. Otherwise, it is a pure capacitor bank (default option).
- Tuning: The series tuning frequency of the filter bank in pu, applicable only if filter configuration is chosen. For example, in a 60-Hz system, a value of 4.7 means that it is a $5^{th}$ harmonic filter tuned at a frequency of 282 Hz. This is an editable field.
- Connection: Bank configuration:
  - Wye: Wye connection option for 3-Phase bank
  - Delta: Delta connection option for 3-Phase bank
  - LN: Line-Neutral connection option for 1-Phase bank
  - LL: Line-Line connection option for 1-Phase bank

The user can also choose to add more capacitor banks to the circuit model. The bus where the new capacitor bank is desired is specified by clicking on the desired location on circuit plot to be followed by clicking on the "Read Bus" checkbox. This will cause the name of the selected bus to populate the "New Cap at Bus" field. This capacitor can then be added to the circuit by checking the corresponding "Add to Model" field, and the added capacitor bank will now show up in the table on the top along with the already existing capacitor banks. If desired, up to ten capacitor banks can be added to the base circuit. To remove an added capacitor, deselect "Add to List" in the lower table.