

The Attributes tab

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1 Introduction

The Attributes tab is designed to provide a quick access to some useful device attribute settings. All device attributes are also accessible through the right-click device Attributes menu. Using attributes is part of the open architecture methods available in EMTPWorks. It is an advanced feature that must be used carefully to avoid damaging device data. There is only a minimal error checking for attribute data errors and the user must follow provided instructions carefully.

2 Attribute visibility

Device attributes can be set to become visible in the design background. This allows to provide a quick visual feedback on entered device data without reopening the device data forms (device webs).

The right-click 'Hide' visible attribute menu allows to hide an attribute, the "Select attribute visibility" section is used to hide or show an attribute. When an attribute's visibility checkbox is checked it becomes visible, when it is unchecked it becomes invisible. The checkbox will reflect the last user selection on this tab or through other menus.

Reserved attributes are those that are controlled by EMTPWorks and the contents of which should not be modified by users.

The accessed attributes on this tab are:

- Value: This reserved attribute is used by some devices to show device data.
- Value1: This reserved attribute is used by some devices to show more device data.
- Value2: This reserved attribute is used by some devices to show more device data.
- Part: The reserved Part attribute holds a unique device part name. It is a fixed attribute recognized by EMTP for builtin devices.
- Name: The Name attribute holds the device name.
- Description:

This attribute is reserved for showing various device descriptions, such as scope selections and presence of initial conditions. The currently available description icons are:

- ?v the device has a voltage scope request
- ?i the device has a current scope request
- ?p the device has a power scope request
- ?s the control device has an output signal scope request
- ?t the random-time data based device has a scope for random time
- ?T the random-time data based device has a scope for actual (real) random time
- ?m the device has machine variable scopes
- >v the device has a voltage observe request
- >i the device has a current observe request
- >p the device has a power observe request
- >e the device has an energy observe request
- >S the device has a switch status request

- !i the device has initial conditions on current
- !v the device has initial conditions on voltage
- !h the device has initial conditions

The contents of the Description attribute are regrouped by the first character tag. If, for example, the same device has voltage and current scope requests, then the Description attribute will hold: ?vi.

3 Color coding

The color coding checkbox allows turning on and off the color coding feature of a device. When it is checked, the device color will be allowed to change to reflect conditions set by entered data. In the case of the “V ac” source device, if the start time t_{start} is smaller than zero, then the device symbol line color is automatically changed to red to reflect a source active in the steady-state solution.

4 User Notes for this device

The Notes section is used to store user notes related to the device.

5 Programmable scopes

The programmable scopes section is used to enter variables for controlling device scope request data from subcircuit masks.

The programmable scopes are available for 1-phase or 3-phase devices. The “Phase A” field is used for 1-phase devices or for phase “a” of a 3-phase device. The “Phase B” and “Phase C” fields are used to enter scope variable names for a 3-phase device.

The programmable scopes are supported for all devices with the standard Scopes tab.

This version of EMTWorks does not support programmable scopes for control devices.

The programming method is simple, the variable named in a given programmable scope field is used from the subcircuit mask to turn on the desired scopes. The variable is a string with comma separated scope tags. Only the scopes available in the target device can be turned on.

The scope variable name can be any name chosen by the user. Illegal characters in scope variable names are automatically rejected. The mask can control as many device scopes as required. If a scope variable name is unresolved it will result in an error.

In this example the variable Scope_of_switch (arbitrary name) is turning on the voltage and current scopes:

```
Scope_of_switch='?v,?i';
```

The example of Figure 1 is used to demonstrate scope programming. The mask of the subcircuit Fault_device is shown in Figure 2.

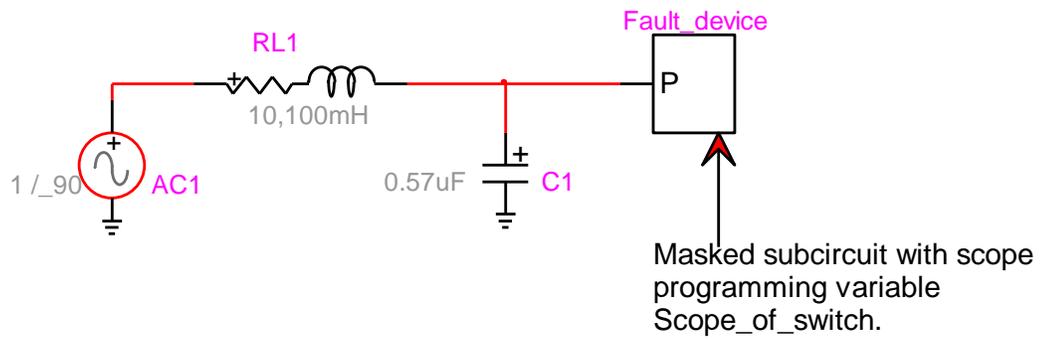


Figure 1 Example of programmable scope usage

The contents of the subcircuit Fault_device are shown in Figure 3. The Attributes tab of SW1 is shown in Figure 4. Its programmable scope "Phase A" is holding the variable name Scope_of_switch.

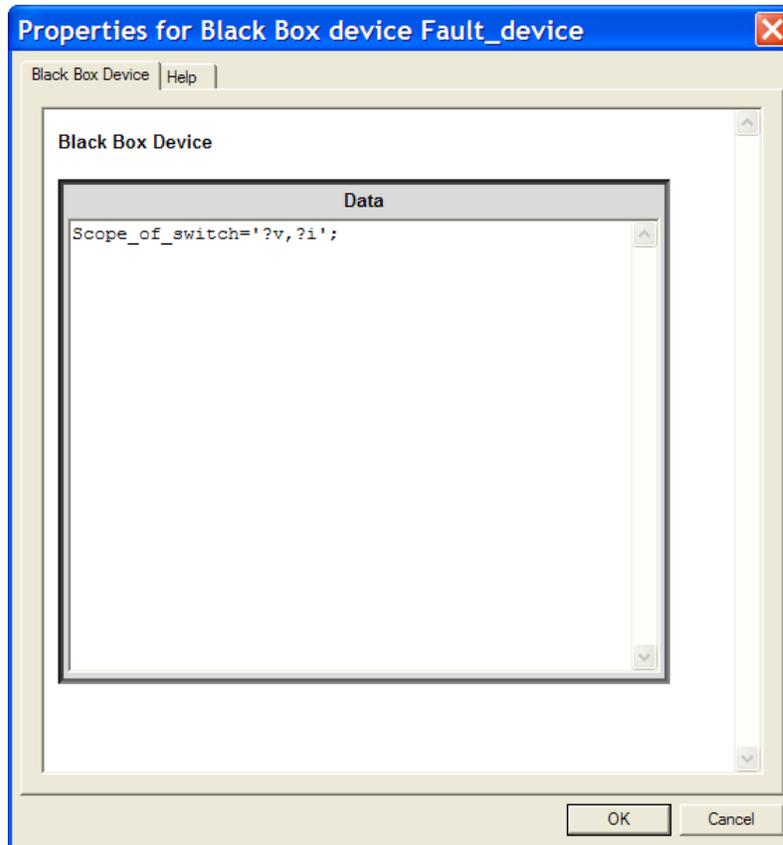


Figure 2 The mask of subcircuit Fault_device, example using black_box.dwj mask script

Device with programmable scope variable Scope_of_switch.

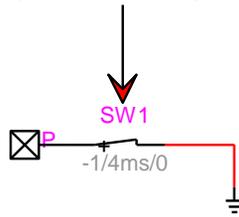


Figure 3 The contents of the subcircuit Fault_device

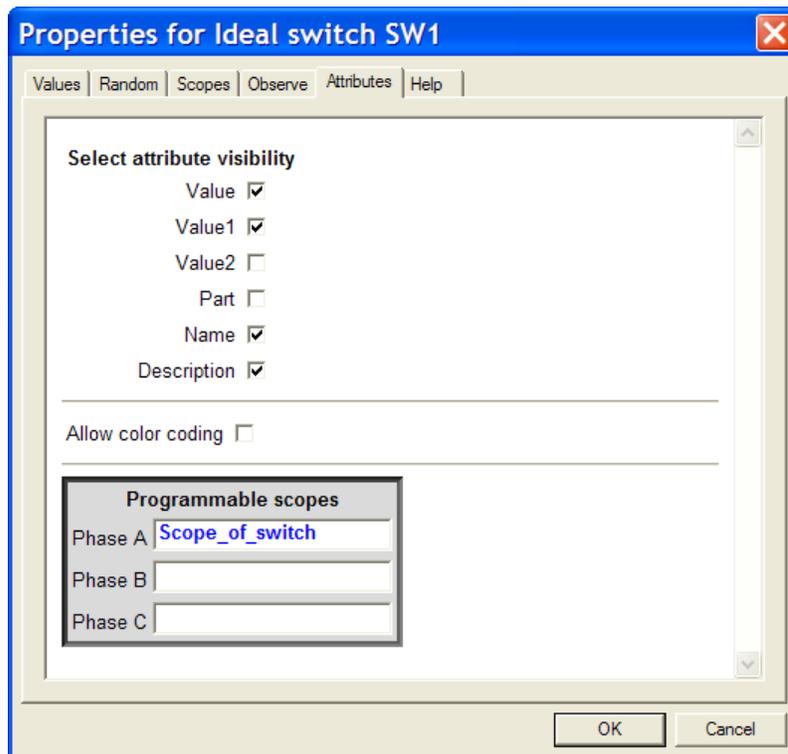


Figure 4 The Attributes tab of SW1

In addition to the mask selection presented in Figure 2 it is possible to use a script_black_box.dwj. This type of mask is shown in Figure 5. Now the scope variables are transmitted using strings:

```
ScopeA= "?v"
ScopeB= "?i"
ScopeC= "?p"
```

It is noticed that the strings must be now enclosed between double quotes. In this case the targeted subcircuit device is three-phase.

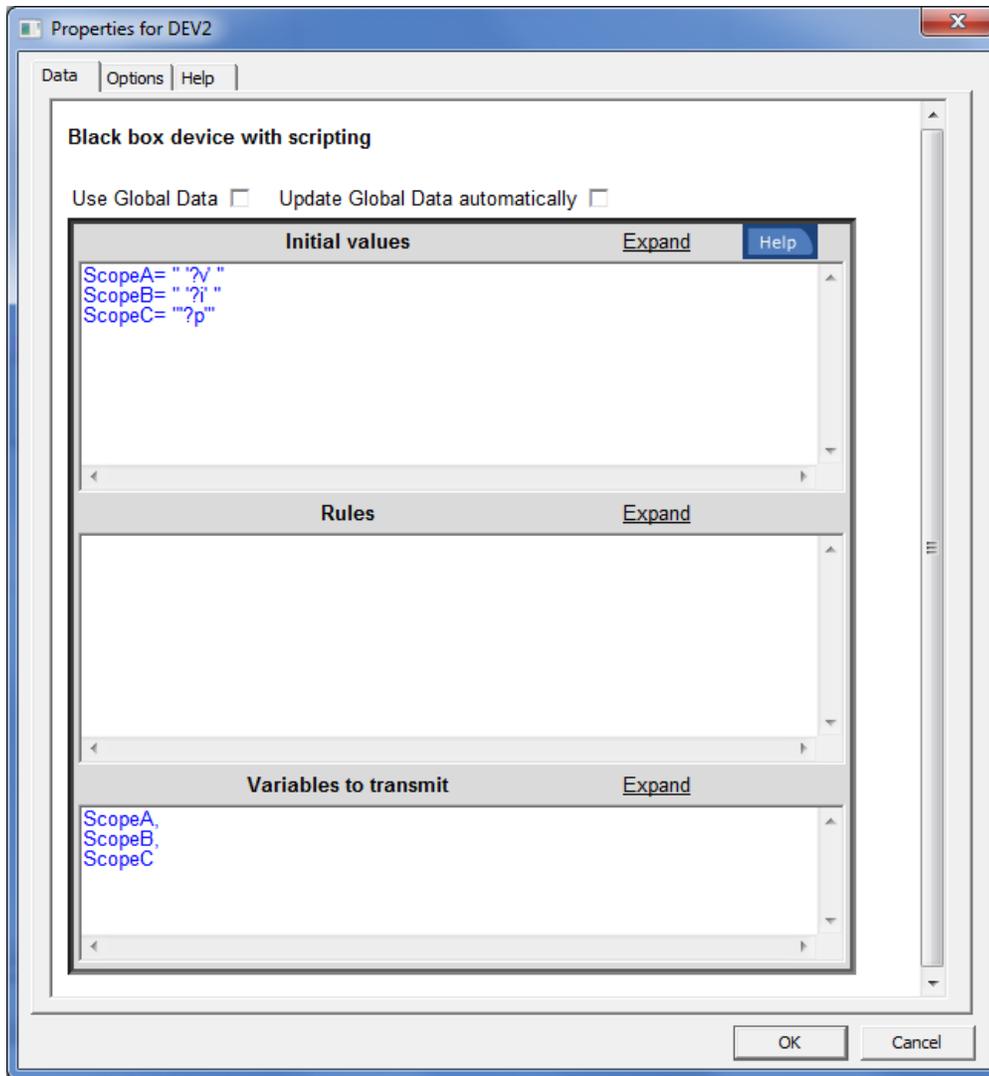


Figure 5 The mask of a subcircuit, example using script_black_box.dwj mask script