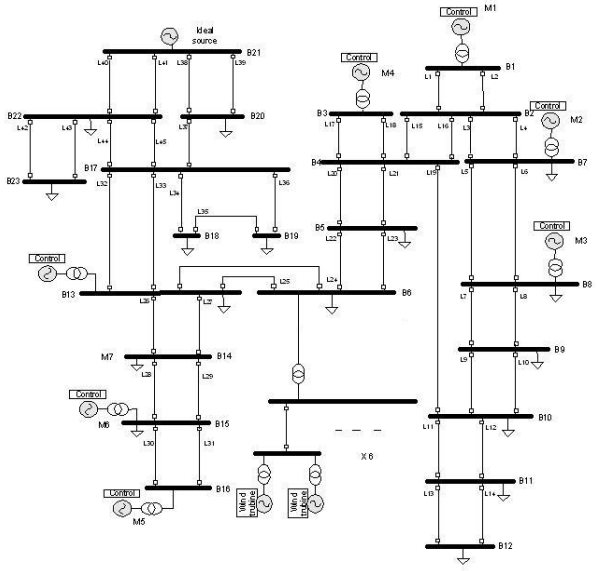
Real-time simulation of a 23-bus network, connected to an offshore wind farm

The model being simulated in this network is of a 500 kV transport network. The network consists of 45-distribution lines supplying power to 17 loads of 120 MW and 30 MVar. The simulation frequency is 60 Hz. There are seven 1000 MVA hydraulic generation turbine plants (synchronous machines and regulators) connected to the network. A 10-turbine wind farm is also connected to the transport network.

This model represents a typical electric network containing loads, generation machines, electronic devices and distribution lines. It shows the capacity of eMEGAsim to simulate this type of network in real-time with good performance. This model is executed on an Intel dual quad-core machine running at 2.3 GHz. It is distributed among 6 CPUs as follows:

- 10-turbine wind farm model, running on 1 CPU with step time of 35 μs
- Controller model, running on 1 CPU with a step time of 120 μs
- Network model, running on 4 CPUs with a step time of 58 μs

With eMEGAsim it is possible to insert a fault in the network or in the windfarm - A to ground, AB to ground, or ABC to ground – and simulate the loss of a machine or transmission lines and observe the consequences.



23-bus network connected to an off-shore wind farm.

Solution configuration	
Solutions package	eMEGAsim
Hardware enclosure	8-CPU HILBox
Software modules	RT-LAB, RT-Events, ARTEMIS