Elec Calc™

Curve-based selectivity module

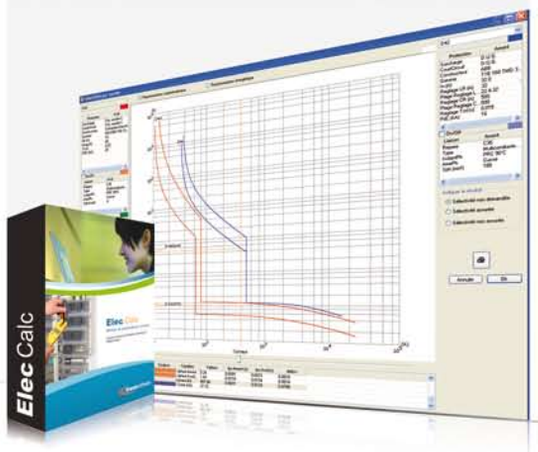
The curve-based selectivity module is an essential tool allowing protection devices to be adapted to ensure that a fault at a particular point in the installation does not lead to the shutdown of the entire installation.

To ensure maximum safety, selectivity can be applied in parallel to cascading. Specially designed to satisfy the needs of electricians, this module can:

- check selectivity between either fuses or between circuit breakers, or circuit breaker/fuse selectivity,
- perform a multi-manufacturer comparison on the selectivity of the equipment,
- make precise adjustments to protection devices,
- supply a full regulatory file including selectivity tables.

Partial or total selectivity is an operating guarantee enabling you to protect your installations and avoid costly complications linked to cascading installation faults. It is essential in certain sectors where any loss of power can be catastrophic:

- health care institutions
- batch processes
- continuous operation processes where interruption leads to production loss or damage to production tools etc.



Selectivity module in Elec Calc

In addition to the sizing of the various components in the installation via **Elec** Calc, it is possible to optimize the choice of protection devices to take selectivity into account.

The principle adopted for this is to combine curves. Based on tripping curves modeled using manufacturer data, the tool combines the tripping curves for the upstream and downstream protection devices on a log/log graph. This method allows the selectivity to be validated whatever the brand and type of protection may be (brand X upstream and Y downstream, circuit breaker upstream and fuse downstream, etc.).

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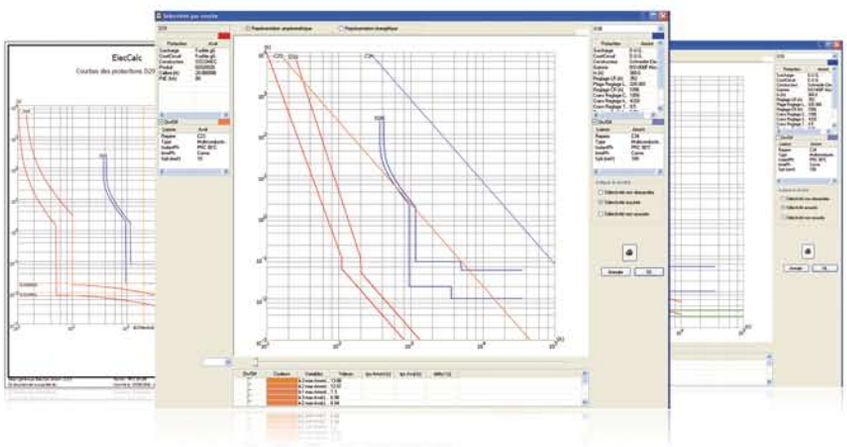
Elec Calc™

The costs of loss of power in commerce and industry have been estimated in the United States at some 10 billion euros per year, whereas spending on protection devices is less than 5% of this amount.

(sources: www.lpqi.org)

Possible causes leading to a loss of power include the lack of selectivity in protection devices. The aim of selectivity is to disconnect the faulty receiver or feeder only, whilst maintaining the power to as much of the installation as possible.
This combines safety and with service continuity of service. This concept is particularly important for devices located at the entrance to the installation where nuisance tripping would have even more severe consequences.

Article 535 of standard NF C 15-100 describes good industry practices with regard to selectivity. The DHOS/E4/2006/393 circular of September 8, 2006, regarding the technical conditions for power supply in public and private health care institutions, or standard NF C 15-211, regarding low voltage electrical installations in premises used for medical purposes, refer explicitly or implicitly to this principle.



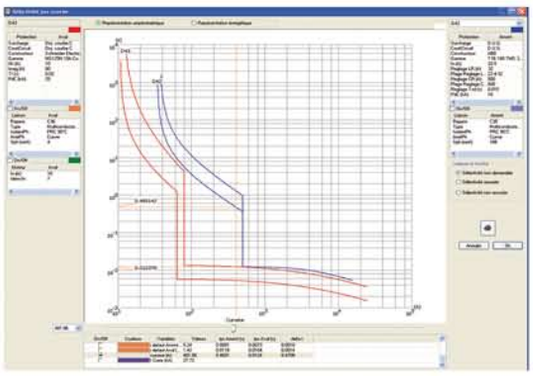
Dynamic viewing using curves showing selectivity between protection devices

Operating principle

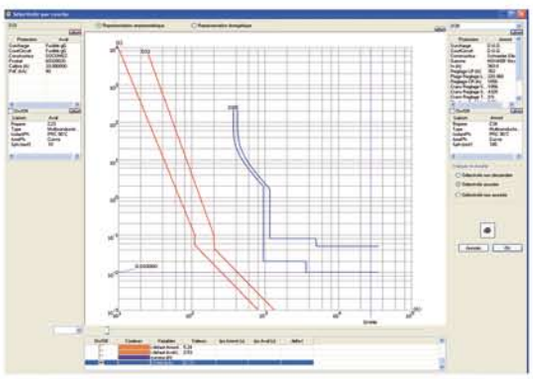
By projecting short circuit currents onto the graph, users can assess the selectivity of the two devices analyzed.
In addition to displaying the tripping curves for the protection devices (circuit breaker or fuse); the module also enables users to view the thermal stress curves for the cables of the circuits upstream and downstream.

Users can check the resistance of the insulation in short circuit conditions. It is also possible to display the starting curve for a motor feeder, enabling the user to ensure that the starting current does not cause the protection devices to trip unexpectedly.

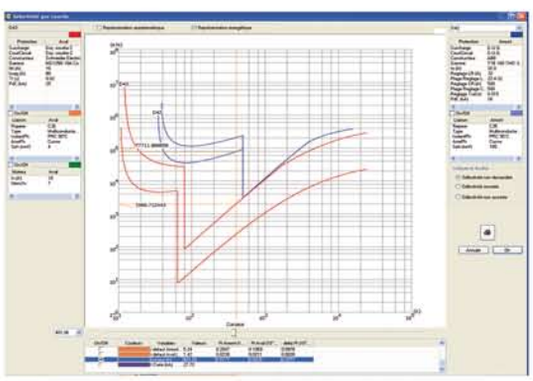
To optimize the selectivity study, modifications to the settings of the upstream and downstream protection devices can be made directly from the module interface (long delay, short delay, timer, implementation of the I^2t function, etc.).
When the results are validated, these modifications are shown in **Elec** Calc to check the sizing of the installation.



Circuit breaker_Circuit breaker selectivity image: Current graph. Protection of the upstream and downstream circuits by two circuit breakers of different brands. Selectivity guaranteed for a short circuit current of 400A. Partial selectivity up to 500A.



Circuit breaker_fuse selectivity image: Current graph. Protection of the upstream and downstream circuits by two different devices:. circuit breaker upstream and fuse downstream. Full selectivity.



Power Circuit breaker_Circuit breaker selectivity image: Power graph. Protection of upstream and downstream circuits guaranteed by two circuit breakers of different brands Selectivity guaranteed for a short circuit current of 400A. Partial selectivity up to 500A.

Official dealer in Hong Kong and Macau

SOCOEL LIMITED
電子機械顧問有限公司

Suite 2611, langham place, office tower, 8 argyle, street, mongkok, kowloon, HONG KONG
香港九龍旺角亞皆老街8號朗豪坊辦公大樓
2611室香港亞洲

Tel (Hong Kong): +852 2781 3017 - Fax (Hong Kong): +852 2359 6196
tracesoftware@socoel.hk - www.socoel.hk