

**CYME**

Power Engineering Software and Solutions

# DC Load Flow and Short-Circuit Analyses

## Perform load flow and short-circuit analyses on your DC networks

Ensuring that the DC devices, typically found in industrial systems, are working safely and within parameters under various operating conditions is a concern for power quality in lower voltage systems.

The DC Load Flow and Short-Circuit Analysis modules of the CYME software enhance the capabilities of the software to execute simulations on DC back-up systems and safe supplies, independently or as connected to the AC power system.

### DC Modeling

The CYME software supports the modeling of dc auxiliary power systems (loss of ac power) and of industrial installations with dc equipment and processes.

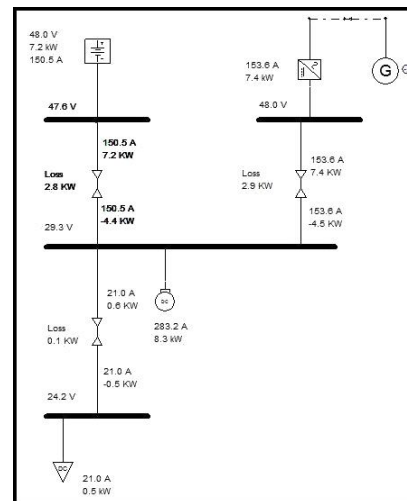
The CYME Equipment Library includes DC equipment such as station batteries, chargers, Uninterruptable Power Supplies (UPS) and DC/DC converters.

In addition, DC versions of the following components are included in the library: cables, impedance branches, protective devices, loads and machines. The user can build any DC network with all the necessary network components.

The DC network can be connected to the AC system through a battery charger or a UPS. Load flow and short-circuit analyses can be executed on the DC network or on the entire system including the AC network.

The voltage and current distortion resulting from the connection of the charger and/or the UPS to the AC network can be studied with the Harmonic Analysis module.

The harmonic content can be entered as per the equipment manufacturer data sheets.



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## DC Short-Circuit Analysis

The DC Short-Circuit Analysis module is dedicated to calculating fault levels in DC networks and systems.

- Fault analysis on all network buses and nodes
- Fault analysis at user defined location
- System-wide fault current and voltage profiles
- Automated sliding fault option on DC cables
- Option to include or not contributions from DC equipment
- Machine current contribution reports.
- Pre-fault nominal or DC load flow voltage profiles
- Fault current security factor for minimum and maximum fault studies

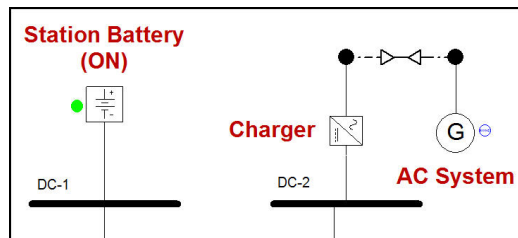
## DC Load Flow Analysis

The DC Load Flow Analysis module supports the steady-state analysis of the any DC systems under various operating conditions.

The solution algorithm is the full Newton Raphson with or without constraints utilizing sparse matrix/vector methods.

Features of the DC Load Flow Analysis include:

- Embedded maximum output current, reverse power flow detection and control
- Automatic update of the loading of chargers and UPSs on the AC system
- Customer load model library manager for any type including constant power, current, impedance, composite and voltage sensitivity exponent model
- Load and motor scaling factors
- Five limit categories for nominal, planning, emergency or any user defined loading criteria
- Abnormal conditions color coding on the network one-line diagram as per user-defined criteria.



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