

The new SACE Emax 2 All the advantages for Consultants

SACE Emax 2 is the new air circuit-breaker from ABB that can simplify every part of a project and provide a compact, flexible and safe product for any need.

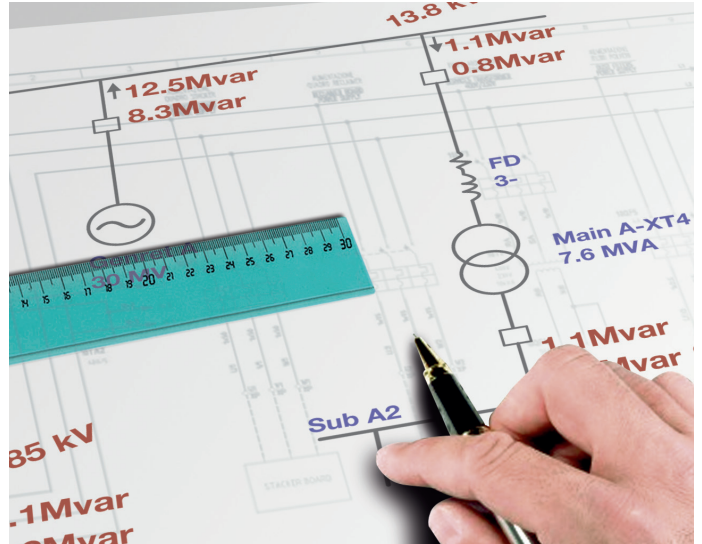
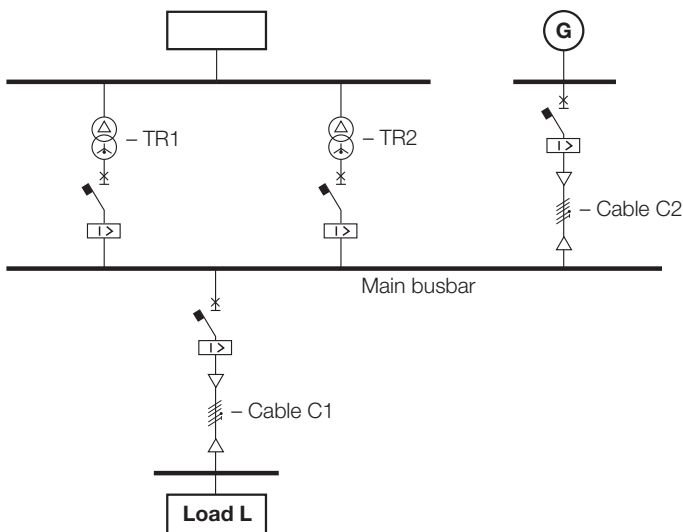
Emax 2 provides a set of functions so complete and advanced that it rivals those of medium voltage relays; the difference being that all wirings and software are embedded inside the breaker.



Emax 2 is also one of the safest breakers ever built: suitable rails and blocks make racking out and lifting up operations safer than ever. Moreover, a key lock in open position can be used while performing maintenance operations and the breaker springs are always covered during the installation of the accessories.

Let's go thru an example in order to show the main features of Emax 2:

Example: Two transformers in parallel linked on the same bar, one Co-Gen unit, LV load(s)



With this very easy schematic (just one LV load, for the sake of simplicity), we can represent many different projects, both industrial and commercial.

The co-generator is providing additional power to the installation, lowering the amount of the energy drawn from the public network. Both transformers are able to feed the all the critical LV loads so that in the event of a fault on one transformer only the breaker relevant to that transformer has to trip.

Some of the most common goals to be achieved for an installation like this may be: ensuring total selectivity between circuit breakers, guaranteeing effective protection of the co-generator, providing accurate measuring for energy management and providing information about the status of the breaker to a Scada or a Building Management System (BMS).

Some less common, but not less important, goals may be: ensuring redundancy in the communication loop (if the installation is a critical application), providing an effective load shedding scheme for peak shaving purposes and controlling the Power Quality.

All these aspects can be perfectly covered by Emax 2, in a simple and effective manner.

We can divide Emax 2's benefits into four categories: benefits for protection needs, benefits for measuring needs, benefits for communication and benefits for plant management.

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Protection

Protection from abnormal conditions (abnormal currents, abnormal voltages) is obviously the very first task for granting safety.

In addition to providing unmatched performances in short-circuit conditions, Emax 2 is able to provide plug-and-play solutions for any protection need: it can grant protection of the generator without the need for external dedicated relays, guarantee total selectivity using zone selectivity between upstream and downstream breakers and provide the maximum continuity of service thanks to the embedded directional protection (in the case of a fault on one transformer, only that transformer will be disconnected).

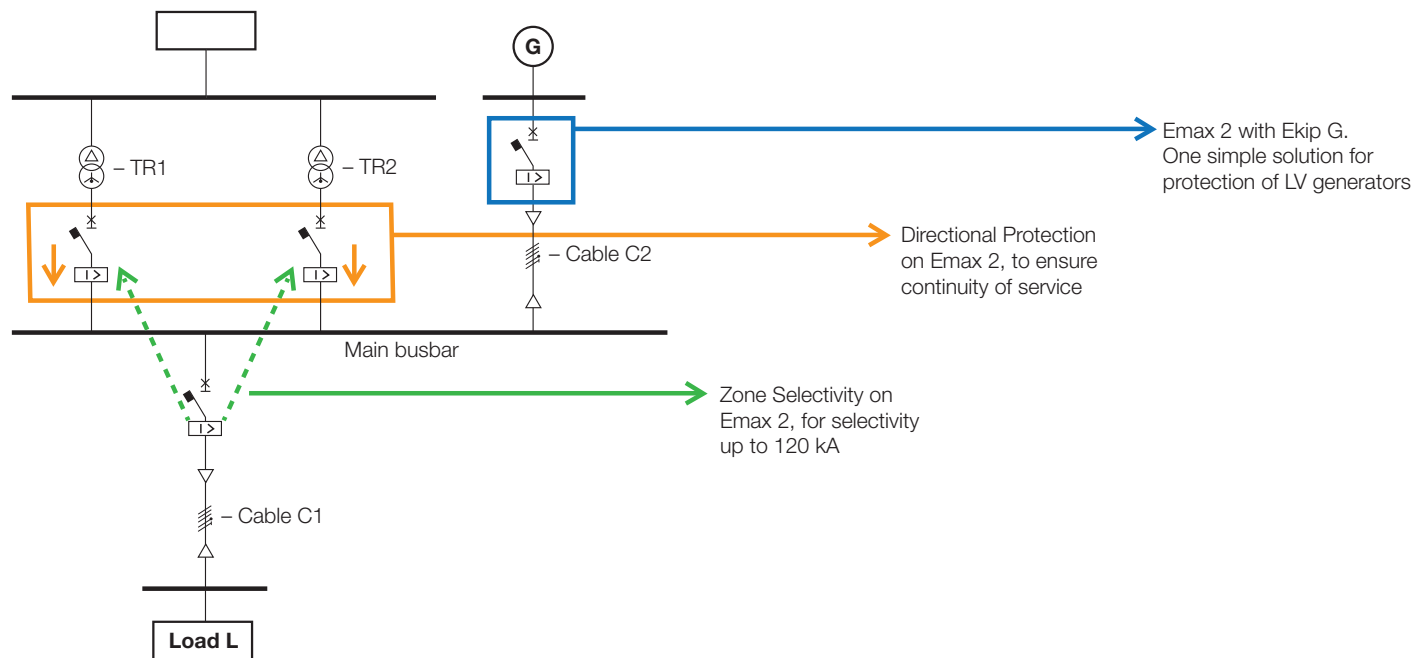
Moreover, Emax 2 is fully integrated in DOC, the ABB software dedicated to electrical plant designing. Emax 2 settings made with DOC can be downloaded directly on the trip units, avoiding any possible mistakes.

Measuring



Traditional measuring (currents, voltages, powers, etc.) is granted by Emax 2 with first class accuracy: both current and voltages are measured according to IEC 61577-12 Class 1. Moreover, with Emax 2, integrated, true power quality analysis as a standard feature is a reality.

The Ekip Hi-Touch version of Emax 2 provides a Network Analyzer feature that controls the quality of power in real time



and with extreme precision in accordance with EN 50160 and IEC 6100-4 30. It is able to analyze the quality of the energy absorbed by the installation in terms of harmonic content, micro-interruptions and voltage gaps and makes all the parameters available through the display or communication module.

Communication



For the first time, the greatest variety of communication protocols is available directly on the circuit breaker. Not only Modbus or Profibus, but also Devicenet and Ethernet

based protocols like Modbus TCP-IP, Profinet and IEC61850. Thanks to its IEC61850 communication capability, Emax 2 is the first low voltage breaker ever to be perfectly integrated in the Substation Automation world of possibilities. When the installation is critical, it's possible to install two communication modules so that the breaker can send information on two different communication systems at the same time.

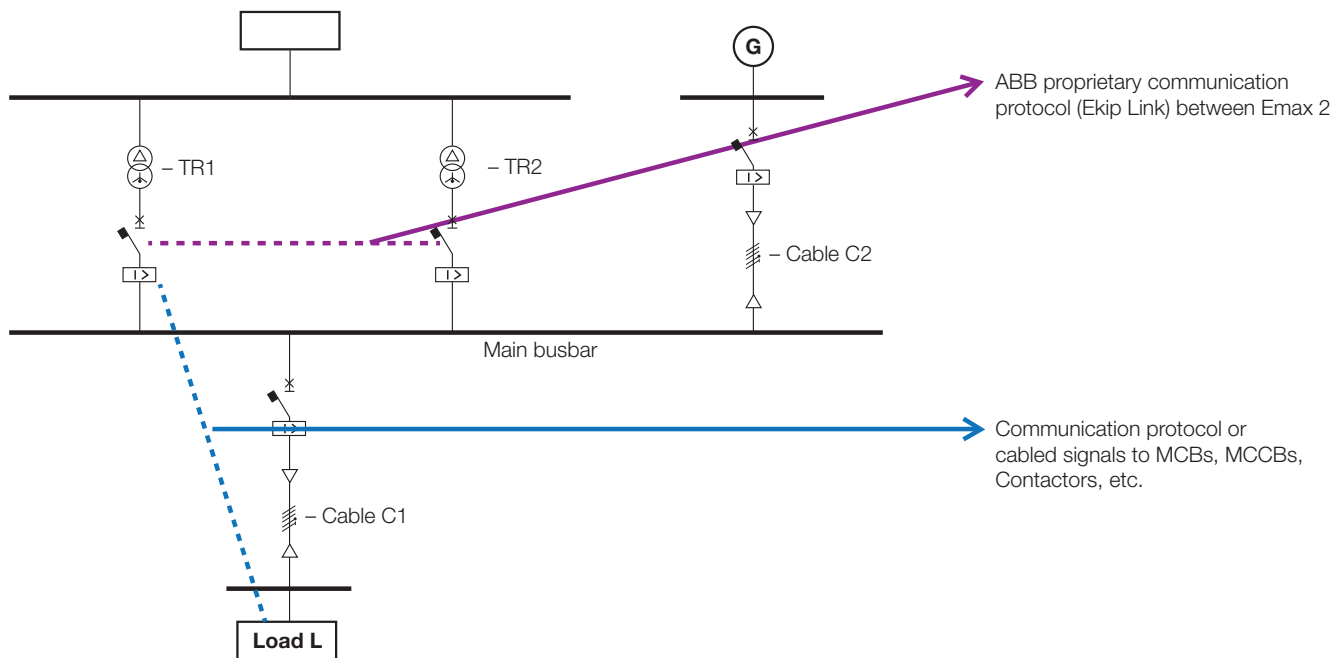
Plant management (load control)

Any time interruptible loads are available, Ekip Power Controller, a simple load management system, is available for Emax 2.

Using an advanced algorithm, Ekip trip units can implement an effective load shedding / load inserting routine, basing the actions on their accurate measurement.

One Emax 2 acts as a master of the installation, collecting information from other Emax 2 if needed.

After the measurements are analyzed, the Emax 2 that is the master provides load shedding / load inserting by means of physical signals or by means of communication.



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