



**Title**  
**PROGRAMABLE METHOD FOR CURRENT SENSOR FAULT DETECTION OF 3-PHASE ELECTRONIC INVERTERS**

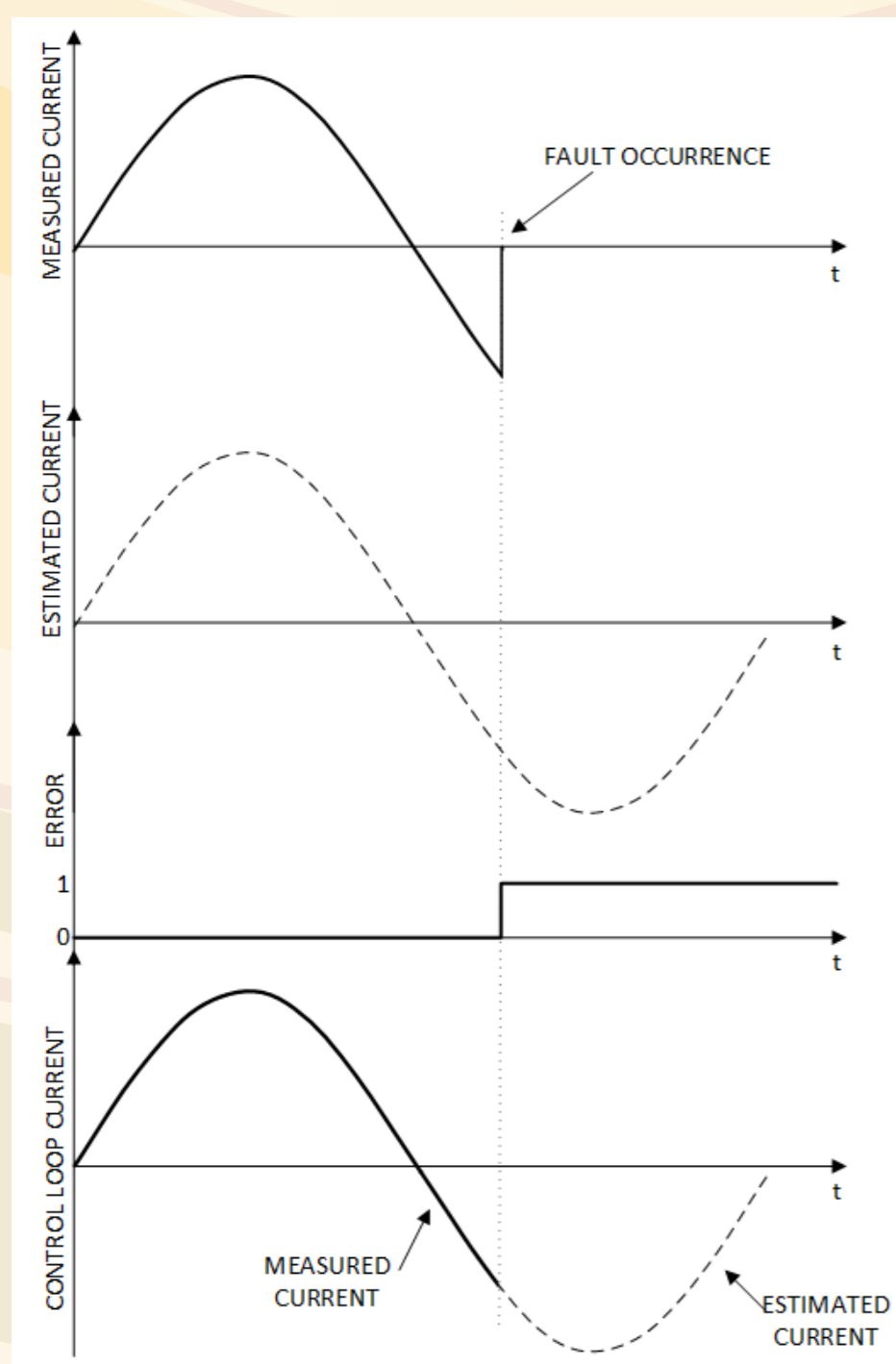
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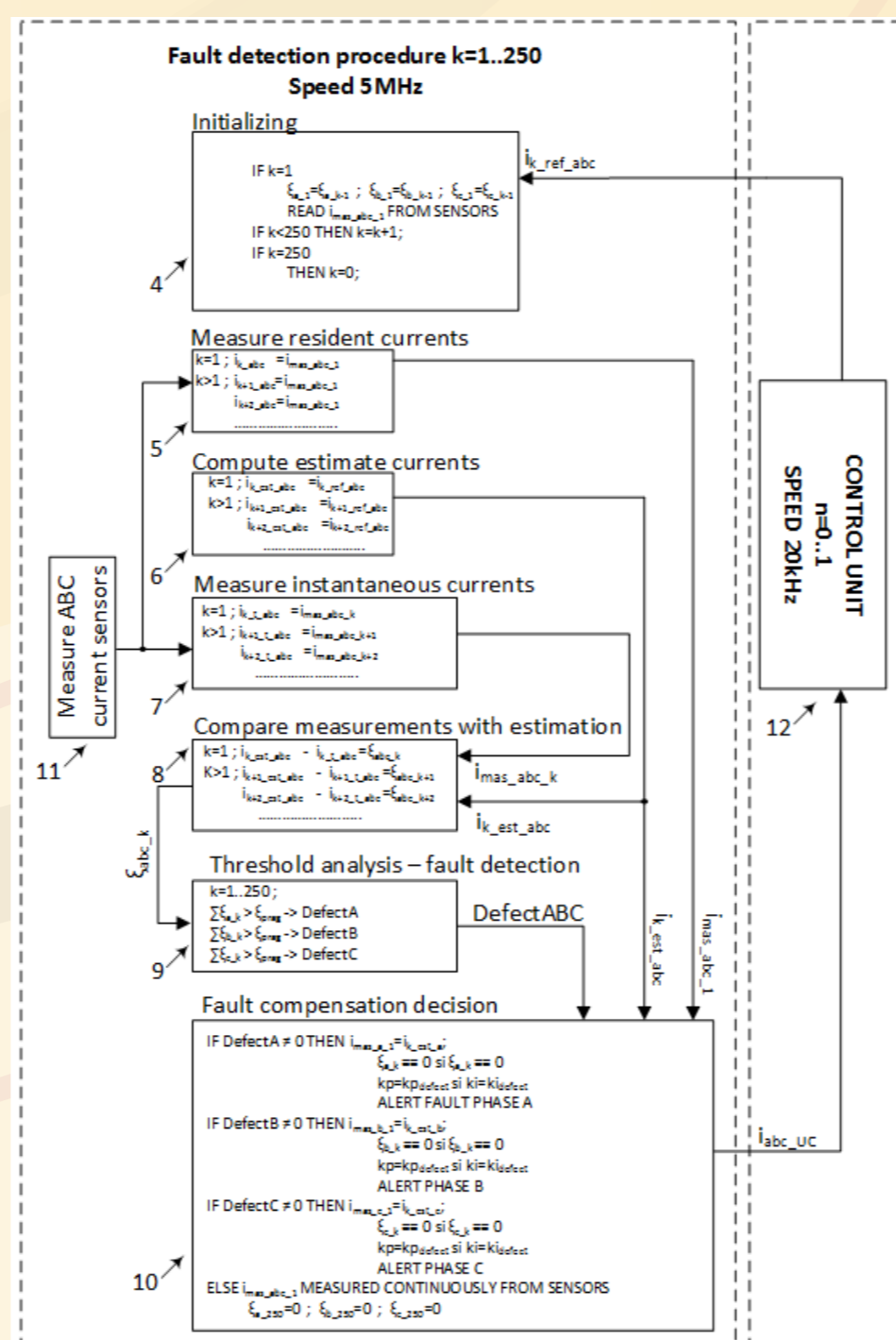
**Short presentation**  
The invention refers to a method of detecting the current sensors faults of 3-phase inverters that is running at a rate of 250 time higher than the rate of the actual control loop. It permanently monitors readings from the sensors and computes the difference between the reference values and the actual measured ones. The difference is compared with an adaptive threshold. The comparison yields if a fault occurred on a certain sensor and decides the replacement of the faulted measurement with an estimated one and also modifies the gains of the control loop's PI regulators, adapting them to the new operational regime. In the same time, it stops the fault detection procedure for a certain period of time till the eventual occurred transient due to the current replacement passes. By this, the detection, isolation and compensation of the fault occurred is handled by the strategy in-between two consecutive iterations of the actual inverter control loop. The fault detection procedure executes 250 calculations (detection) between two consecutive calculations of the control loop.

**Applicability**  
The invention is dedicated for the most used type of electronic inverters used in industry, green energy as well as in automotive industry. It refers to 3-phase inverters that are always equipped with current sensors on at least 2 or even all the 3 phases. The method can very easily be used to detect and compensate line current faults as the exact same approach is applied in order to monitor the currents passing via the sensors.

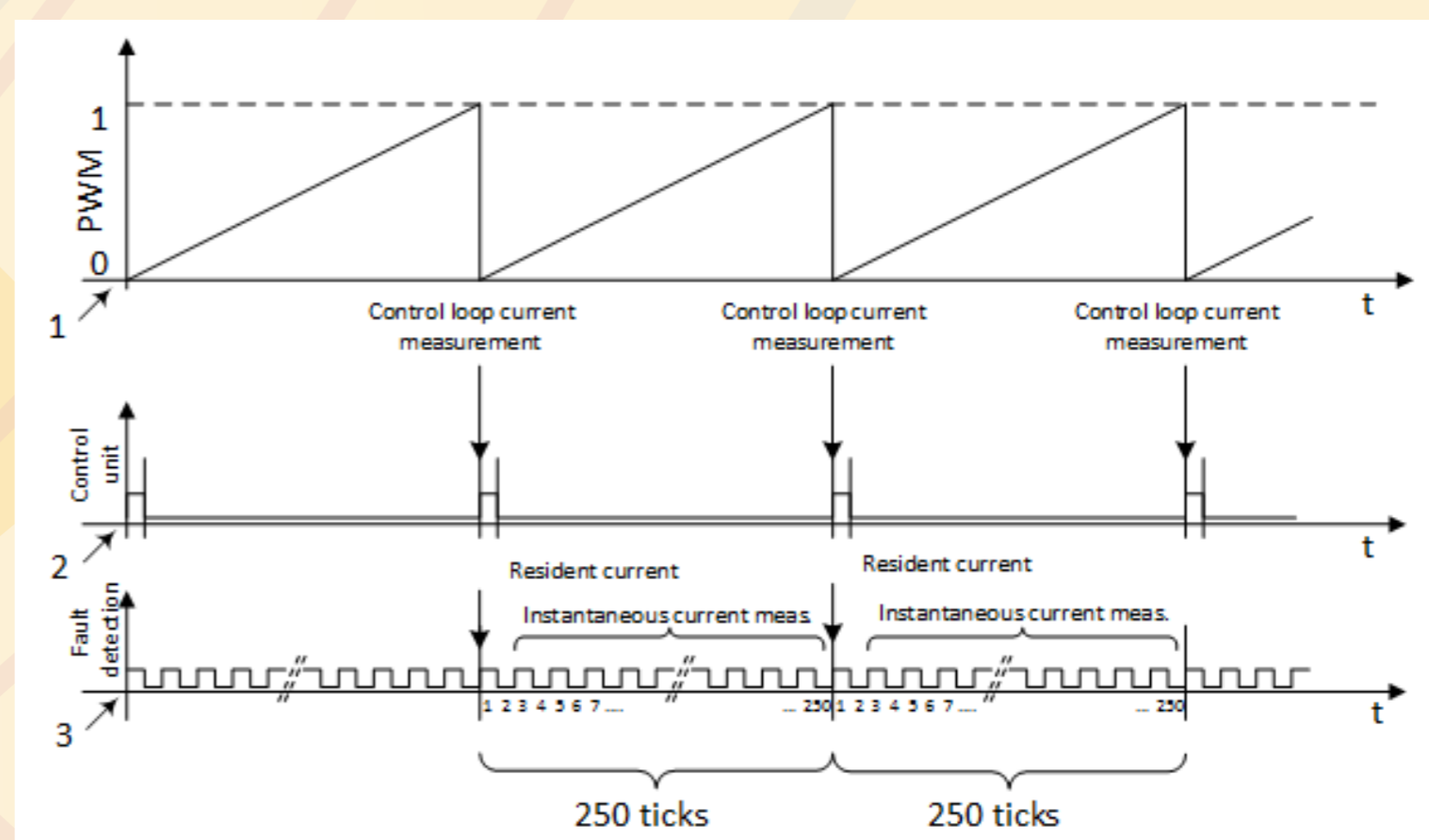
**Images**



The detection, isolation and replacement of the faulted measured current with the estimated one



The fault detection/isolation/compensation algorithm with block diagrams



The speed difference computation frequency between the fault detection and inverter control loop