Enhancing the detector control system of the CMS experiment with object oriented modelling

The control and supervisory systems of the CMS experiment have a distributed, redundant architecture based on SIMATIC WinCC OA.

CMSfwClass is a control systems development toolkit for WinCC OA to add Object Orientation and encapsulation down to the datapoint level.

The toolkit enables modern software engineering techniques:
- System entities modelling in classes.
- Design complex software architectures.
- Rapid implementation with a computer aided engineering tool.

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For a method to be executed from a certain object, it has to exist in the class used to reference the object, or in a less specialized class of the hierarchy.

For every object there will be one datapoint per implemented class. The parent-child class hierarchy determines where to find a particular attribute.