

An attitude determination system suitable for a spacecraft

The invention relates to an attitude determination system.

The prior art teaches an attitude determination system suitable for a spacecraft, which is connected or connectable to a power source and which comprises multiple sensors for measuring attitude-signals of the spacecraft, and a computation unit for calculating the attitude from the measurement signals of the multiple sensors, and a transmission system for entertaining communication between the multiple sensors and the computation unit.

Such an attitude determination system is for instance known from US 5,109,346. In this known system star sensors and gyros are used and the information therefrom is accumulated in a Kalman filter to provide continuous estimates of position and orbit for use when the sun or moon is not visible. The best estimate of position is selected and is used to control the spacecraft without having to rely on ground-based equipment or other spacecraft for the determination of position and orbit.

Data communication between the sensors and the computation system according to US 5,109,346 is with fixed wiring, yet it is also feasible and even preferable that such a system is provided with a wireless communication system of the type that is disclosed in US2007/0049204. In both cases however the attitude determination system may have limited power capabilities which necessitates that keeping energy consumption low will be a prime design consideration. What this prior art does not teach are the features that differentiate the invention from the prior art, which will be explained further on in this description following the introduction of the invention's objectives.

It is a first objective of the invention to provide an attitude determination system with improved energy consumption, i.e. an energy consumption that is lowered in comparison with prior art solutions, which is one of the first challenges the invention seeks to overcome.

Further objectives of the invention are to provide the possibility of increased modularity and autonomous operation of the attitude determination system of the invention.