

Encoder Technology from maxon motor on Board Curiosity.

The landing of the Mars rover Curiosity took seven exciting minutes. Now it will be looking for signs of life on the Red Planet. maxon encoder technology will play a part in the successful excursion of the rover. This is the continuation of the success story of maxon products in outer space and on far away planets.

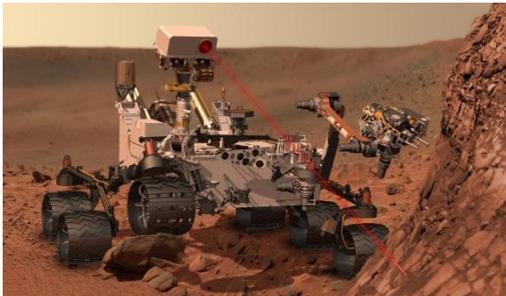


Figure 1: Mars Rover Curiosity examines Mars rock. Credit: NASA / JPL-Caltech

The new Mars rover Curiosity ended its six month long journey to Mars with a successful landing on August 6th 2012. As everything went according to plan, the control center at Jet Propulsion Laboratory (JPL; California) erupted in cheers. "It was a wonderful landing, everything looked extremely good" said Adam Steltzner, NASA engineer and lead scientist of the JPL landing team, enthusiastically at a press conference. This is the start of a new, exciting excursion on the Red Planet. In contrast to the rovers Opportunity and Spirit, Curiosity can travel further distances on its six wheels and run longer without solar energy as a radionuclide battery gives energy for years. The plan is that the rover shall explore the immense Gale Crater on Mars for signs of life, for two years. And this with

impressive equipment on board - a gas chromatograph will hopefully uncover organic compounds; a spectrometer will analyze the composition of rocks which will be collected by the two meter long robot arm and a neutron source will look for hydrogen in the ground.

“From Mars via the International Space Station to the moon“

On its „Mission to Mars“ Curiosity also has maxon products on board. The MR Encoder technology is built in to the electromechanic joints of the rover. The magnetic sensors are mounted on the drive shafts and are responsible for controlling the motors. Apart from that, maxon development services for the drive systems have also played a part in the 900 kilogram rover being able to carry out its Mars Mission successfully. Curiosity's little brother Opportunity is still on its journey on Mars; for the past 8 years the rover has been exploring Mars with the help of maxon motors. A further success for maxon motor is the SpaceX-Mission to the International Space Station (ISS). Amongst other things, brushless EC motors have been used to move the 2 solar panels which always have to be facing the sun in order to supply the Dragon Capsule with power. More flights to the ISS are already planned; the next in September 2012. In 2015 a further rover will be sent explore Mars for the Exomars Mission. The moon is also in sight - at least for the Chinese Lunar Exploration Program (CLEP) when an exploration rover will be sent to the moon. Numerous research satellites nearer to Earth will also be fitted with maxon drives. The next start of such a satellite its the ESA Sentinel 3 which will fly into space in 2013. Here maxon motors will be used, for example, in a possible emergency to control and secure the fuel valves.

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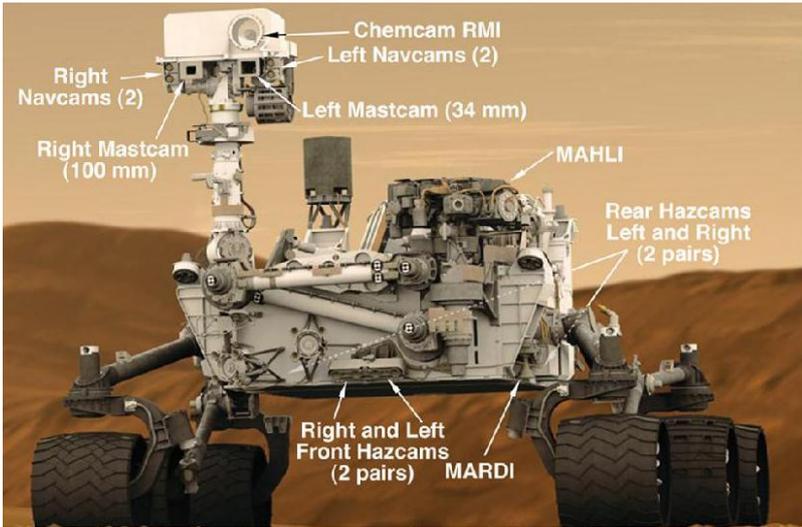


Figure 2: This graphic shows the locations of the cameras on NASA's Curiosity rover. The rover's mast features seven cameras: the Remote Micro Imager, part of the Chemistry and Camera suite; four black-and-white Navigation Cameras (two on the left and two on the right) and two color Mast Cameras (Mastcams). Image credit: NASA/JPL-Caltech



Figure 3: The first pictures sent to Earth by Curiosity after its successful landing on Mars. One of the six wheels of the Mars rover can be seen. Picture: NASA, JPL-Caltech



Figure 4: MR-Encoder Technology from maxon motor is built in to the electro mechanical joint of the rover.