

News Release

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Ariane 5 Rocket: Werum Implements Measurement Command and Control System for Rocket Engine Testbed

Customized Real-time Software Solution for the German Aerospace Center DLR

Lueneburg, June 24, 2009 – Werum Software & Systems has supplied the German Aerospace Center DLR with a new measurement command and control system for the rocket engine testbed P5. The first test of a rocket engine with this new control system was successfully completed in early June 2009. As part of its work on rocket engines the DLR in Lampoldshausen, southern Germany, has been testing the Vulcain rocket engines on the European launcher rocket Ariane 5 since 1988. Werum is general contractor for the project and has worked together with two other suppliers to modernize the command station which controls the testbed and collects the measured data from the unit under test. For many years now, the software company from Lueneburg, northern Germany, has been cooperating successfully with the DLR in the areas of test data management and remote sensing.

Safety First

In collaboration with S.E.A. Datentechnik GmbH from Germany and Cegelec from Belgium, Werum has provided a modernized measurement, command and control system for the P5 testbed. Safety is a critical factor in this project: Approximately 600 m³ of highly explosive liquid hydrogen is used during the test run of a rocket engine. Every one or two months, the DLR executes a test run which takes about 15 minutes and, for safety reasons, these test runs have to be carefully prepared and checked thoroughly for possible malfunction. To protect the testbed and personnel, the real time system has to be able to automatically abort a test run within a response time of no more than 2 milliseconds the moment predefined thresholds are exceeded.

Collecting Data and Operating the Control Station

In the course of a test run, the command and control system stores analogue and digital data at a rate of up to 15 Mbytes. The data is collected via more than 2,000 sensors. In parallel to the data storage process, the system also provides approximately 8,000 parameters for visualizing progress at 14 work stations.

Another essential function of the system is the ability to control and command the testbed. The operator can easily parameterize test runs via a user interface and execute them in a deterministic way, i.e. they can be reproduced under exactly the same conditions.

The command and control station guarantees the ability to work on several test runs at the same time. While one test run is being processed in the testbed, the operator is able to prepare the next one. The configuration of a final, released test is set and can not then be modified before its "hot run". A rights/roles management concept ensures that users are only able to operate the system functions for which they are authorized.

Rocket Tests for European Space Projects

With the P5 testbed, the DLR tests Ariane 5's main Vulcain engine on behalf of the European Space Agency (ESA) and the European space industry. The research facility also tests combustion processes in the engines of liquid propellant rockets and in air-breathing engines for future space transportation systems. In addition, the DLR in Lampoldshausen is actively involved in developing rocket combustion chambers and laser-optic measurement technologies for high-temperature gas flow.

Werum Software & Systems designs standard software products and implements complete software systems for customers involved in research, industry, trade, media, and public administration.

The Test Data Management Systems business segment focuses primarily on software products and projects in the key areas of aviation and aerospace, and the automotive and marine industries. Advanced, reliable, tried and tested solutions can be attributed to Werum's well-qualified, committed personnel and almost 40 years of experience within the company. Werum's comprehensive IT services complete the range of activities offered by the company.

The software provider was founded in 1969 and is headquartered in Lueneburg, Germany. It currently employs more than 350 people in Germany, the USA, Japan, and Singapore.

Contact:

Volker Mensing

Director of Communications

Tel. +49 (0) 4131 8900 - 689

Fax +49 (0) 4131 8900 - 20

eMail: mensing@werum.de

Werum Software & Systems AG

Wulf-Werum-Strasse 3

21337 Lueneburg, Germany

www.werum.de