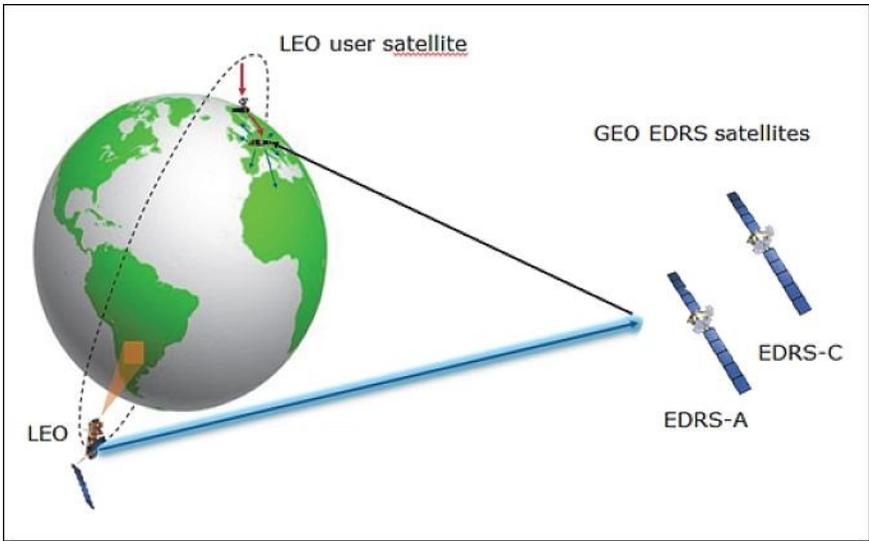


The European Data Relay Satellite System (EDRS) and the Role of DLR



EDRS Space Segment Configuration

The future European Data Relay System (EDRS) is a geostationary satellite system (GEO) with associated ground stations. The European Space Agency (ESA) has signed a Public Private Partnership (PPP) agreement with Astrium GmbH as prime implementation company in 2011. DLR and SES (Astra TechCom S.A.) joined the PPP in 2012 and signed contracts for large parts of the ground segment. By the end of 2014 the first EDRS satellite (EDRS-A) shall be in space and operational.

The EDRS provides different types of optical and Ka-band services, using innovative O-ISLs (Optical Intersatellite Links) and Ka-ISLs (Ka-band Intersatellite Links), respectively. Both ISLs between the Low Earth Orbit (LEO) users and the GEO satellites are bi-directional. The EDRS-A and the EDRS-C payloads offer optical services, whereas the Ka-band services are implemented on the EDRS-A payload only.

With the selected constellation and depending on the number of deployed EDRS satellites one can achieve almost permanent access to low-flying satellites in earth orbits (LEO) ranging from 400 - 1000 km. For those numerous scientific satellites populating these orbits the data access and return will be considerably improved.

DLR has been sub-contracted by Astrium for the implementation of the EDRS ground segment. Additionally DLR will be responsible for the control of the payload of first EDRS satellite (EDRS-A) and for satellite monitoring and control of the EDRS-C relay satellite for at least 15 years.

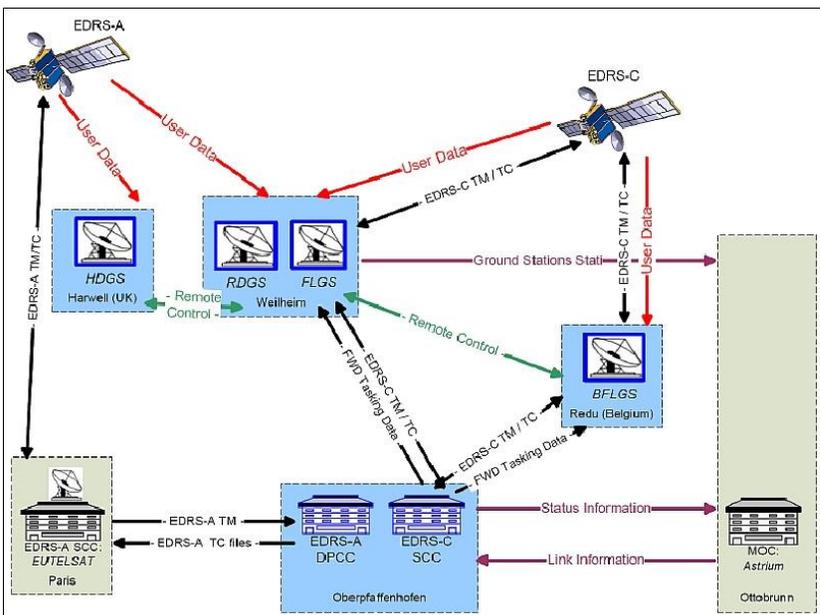
The EDRS satellites will transmit the collected data packets from the low-flying Earth observation satellites to four ground receiving antenna sites located throughout Europe: at ZDBS in Weilheim (DLR-Germany), Redu (ESA-Belgium) and British Harwell. All four ground stations will be monitored and controlled remotely by the Weilheim central station.

In addition the following operational facilities will be established:

The EDRS SCC (Satellite Control Center) facilities, consisting of a dedicated EDRS SCC linked to the EDRS-C spacecraft Operator at DLR/GSOC, and a EDRS-A payload a PCC (Payload Control Center) operated by DLR/GSOC in conjunction with the Eutelsat operated control center for the 9B satellite.

The EDRS MOC (Mission Operations Center) and the back-up Mission Operations Center (B-MOC), which are the interface to the users for the planning of the EDRS services requests will be at EADS/Astrium in Ottobrunn (Germany), while the backup MOC will be installed at Redu Space Services (Belgium). The MOC function is provided by Astrium Services.

The construction of the antennas at Weilheim started in August 2013. By the end of 2014, with the first EDRS satellite in orbit all ground stations at Weilheim will be operational.



EDRS Ground Antennas Construction Site at DLR/Weilheim

EDRS Ground Segment

For a more detailed description of the ERS space and ground segments please refer to: <https://directory.eoportal.org/web/eoportal/satellite-missions/e/edrs>

DLR/Martin Häusler & J. Kehr (Editor SpaceOps News)