Meteosat Data Collection Service

Accurate support for meteorology and weather prediction

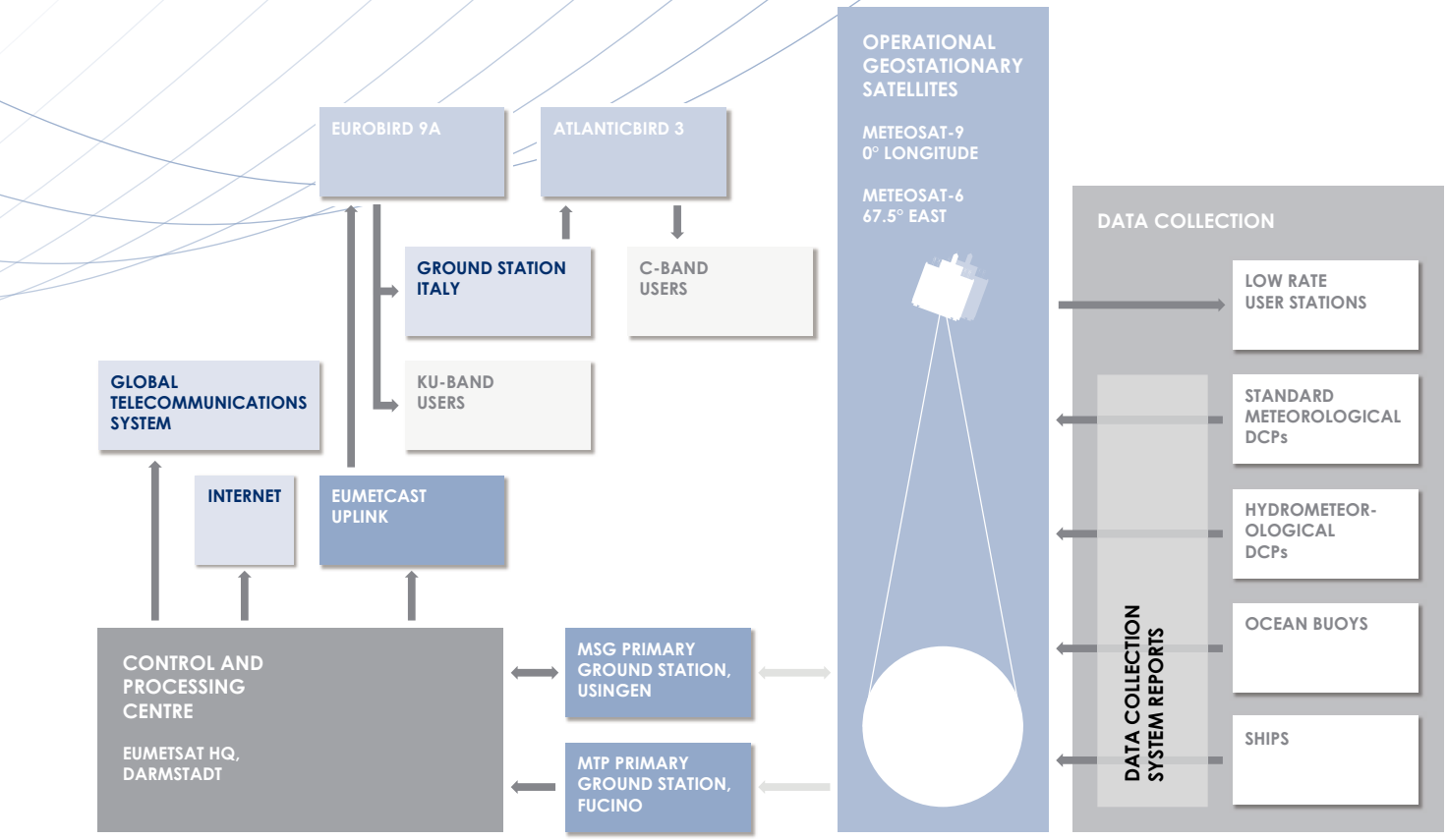
OVERVIEW

The Data Collection Service (DCS) is one of the core services operated by EUMETSAT in support of meteorology and weather prediction. The service enables data collection platform (DCP) operators to use the Meteosat system to receive environmental data collected from DCP platforms. The DCS, initially established with the first generation of Meteosat satellites, has continued and expanded with Meteosat Second Generation, and will also be embarked on the future Meteosat Third Generation. The DCS is particularly useful for the collection of data from remote and inhospitable locations where it may provide the only possibility for data relay.

The Meteosat satellites are located at 0° longitude as well as over the Indian Ocean and acquire DCP data from operators of DCP platforms which are located within the footprint of the satellites. Similar systems are also operated by the US National Oceanic and Atmospheric Administration and the Japan Meteorological Agency, providing worldwide coverage. Some of the DCP bandwidth on board all these meteorological spacecraft is reserved for the International Data Collection System. This system allows operators to receive messages from mobile platforms and on ships or aircraft travelling around the world.

The DCS supports the transmission of data from DCPs to the satellite, as well as the immediate relay of data from the satellite to the ground station and the subsequent basic processing and onward transmission of selected data to the user.

Users can receive DCP messages either using EUMETCast, EUMETSAT's data dissemination system, or through FTP/ Internet, the Global Telecommunications System (GTS), or direct dissemination from the Meteosat satellite at 0° longitude.



Overview of the Meteosat Data Collection System

DCP TYPES

There are three types of DCP:

- Self-timed DCPs transmit at regular intervals and are controlled by an internal clock.
- Alert DCPs transmit short messages, not exceeding 10 seconds duration, when the value of one or more measured parameters exceeds a pre-set threshold.
- Hybrid DCPs combine the self-timed and alert modes of operation.

DCP APPLICATIONS

The Meteosat DCS is used to gather a wide variety of measured environmental parameters; the following examples serve to demonstrate some of the possibilities offered by the system.

METEOROLOGICAL DATA COLLECTION AT REMOTE LAND SITES

The availability of meteorological observations from sparsely inhabited land and ocean areas is often poor. The use of automatically operated DCPs in such areas can provide this information, which is essential for accurate weather prediction. Many such systems have been deployed across Africa under the sponsorship of the World Meteorological Organization.

HIGH-RATE DCPS

A new system of high-rate DCPs (HRDCPs) is planned for operations in 2011. The introduction of HRDCPs will greatly enhance the potential for the use of the DCS, for example by allowing tsunami warning systems to react more quickly to a seismic event, thereby giving more timely warnings to affected populaces. The same DCP types will be available as HDCPs.

CHARACTERISTIC		STANDARD DCP	HIGH-RATE DCP
Baud rate		100	1,200
Current slot allocation		1 minute, 30 seconds	10 seconds minimum
Timing accuracy		+/- 15 seconds	+/- 0.5 seconds
Data per DCP message		649 bytes	minimum 653 bytes for 10-second time slot
Channel bandwidth	MTP	3 KHz	2.25 KHz
	MSG	1.5 KHz	
Maximum number of messages per channel per day		960	8,640
Maximum message size of single message			65,535 bytes

Comparison of characteristics of current DCPs with high-rate DCPs

WATER MANAGEMENT

The management of water resources can be greatly assisted by making use of DCPs. The measurement of precipitation, river levels, river flow rates and water quality are just some of the parameters that can easily be relayed with a DCP. This type of DCP might also be operated in alert mode; for example, a special message might be transmitted once a particular parameter threshold has been exceeded to warn of impending flood danger resulting from the high-water level of a river.

TSUNAMI WARNING SYSTEMS

The Meteosat satellites located at 0° and over the Indian Ocean acquire tide-level data from DCPs situated on moored buoys as part of tsunami warning networks. The data collected and transmitted by the platforms are received by the tsunami warning centres in the form of bulletins disseminated using the GTS. These messages are used to confirm the presence or absence of a tsunami following a seismic event. If a tsunami is detected and when certain other criteria are met, warning messages are distributed to the affected national authorities to activate emergency measures.

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