

Meteosat data collection service

Accurate support for meteorology and weather prediction.

The Meteosat DCS is available at no cost for meteorological applications. Please see the EUMETSAT website for more details: www.eumetsat.int



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 on board future Meteosat Third Generation satellites. 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.

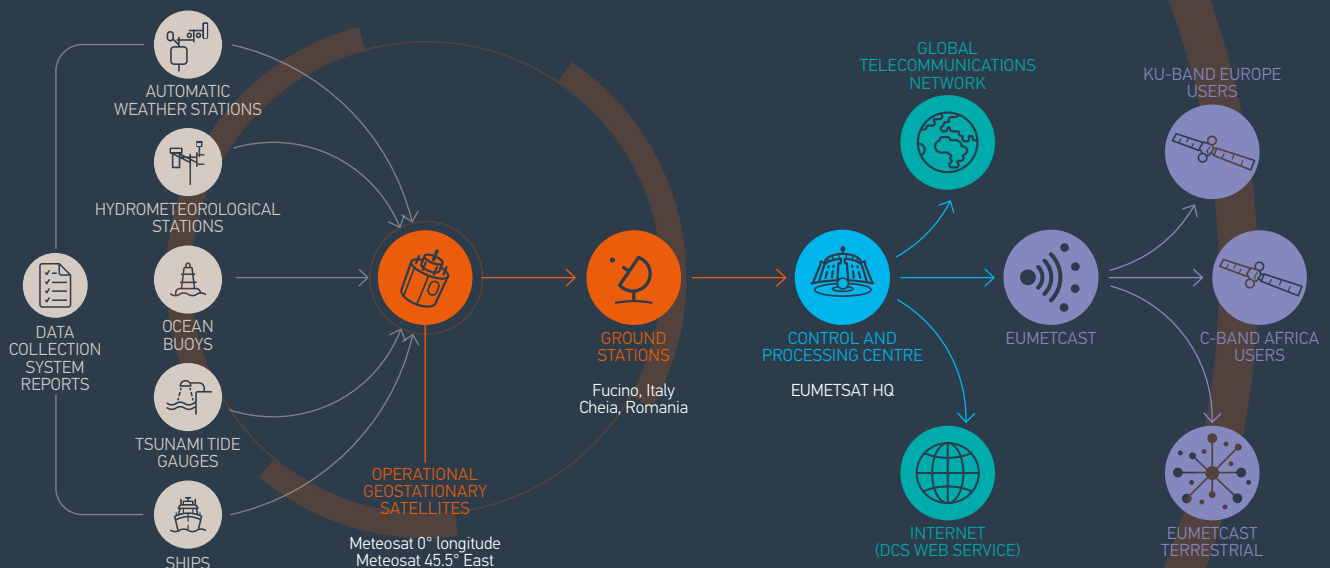
The Meteosat satellites are located at 0° longitude as well as over the Indian Ocean and acquire DCP data from operators of DCP platforms which are located within the footprint of the satellites.

Similar systems are also operated by the US National Oceanic and Atmospheric Administration, the Japan Meteorological Agency, the Indian Space Research Organisation and the China Meteorological Administration, 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 via the internet and the Global Telecommunications System (GTS).

Overview of the Meteosat data collection system





DCP types

There are three types of DCPs:

- 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.

High-rate DCPs

A new system of high-rate DCPs (HRDCPs) has been in operation since 2015. The introduction of HRDCPs has greatly enhanced 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 populations. The same DCP types are available as HRDCPs. Due to the many advantages of the HRDCP, EUMETSAT expects all new DCP projects to utilise the HRDCP.

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 areas is often poor. The use of automatically operated DCPs in such areas can provide these data, which are essential for accurate weather prediction. Many such systems have been deployed across countries in the Meteosat satellite footprints with the sponsorship of the European Union, World Meteorological Organization (WMO), the World Bank, and other international organisations.

GTS to WIS 2.0 Migration

The WMO will transition to WIS 2.0 from the GTS by 2030. EUMETSAT plans to transition DCS data from GTS to WIS 2.0 during the 2025 timeframe. A transition plan is currently being prepared and will be communicated by EUMETSAT by end of 2024.

DCP characteristics

Characteristic		Standard-Rate DCP	High-rate DCP
Baud rate		100	1200
Current slot allocation		1 minute	15 seconds minimum 1 minute maximum
Timing accuracy		± 15 seconds	± 0.5 seconds
Maximum data per DCP message		649 bytes	7343 bytes
Channel bandwidth	Legacy	3 KHz	N/A
	MSG/MTG	1.5 KHz	3 KHz
Maximum number of messages per channel per day		960	5,760

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, when the threshold of a particular parameter, such as the water level of a river, has been exceeded, a special message might be transmitted to warn of impending flood danger.

Tsunami warning systems

The Meteosat satellites located at 0° and over the Indian Ocean acquire tide-level data from DCPs 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.

