

C-MAP

NORWAY

THE ELECTRONIC CHART STANDARD

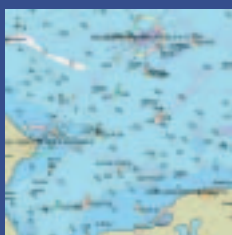
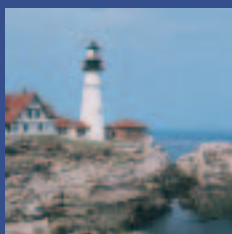
C-MAP Norway A/S

P.O. Box 212, 4379 Egersund

Tel: +47 51 46 47 00

Fax: +47 51 46 47 01

www.c-map.no



Distribution of
**Electronic
Navigational
Charts (ENC)**





C-MAP Norway is a leading producer and distributor of electronic charts operating in many countries all over the globe. It has over 10 years of experience in the digital cartographic field and is an acknowledged innovator in the market.

Provision of a complete professional digital cartographic service to its clients has always been C-MAP's main objective and therefore customer requirements play a key role in the formulation of all services offered by C-MAP.

In today's maritime industry where ease of access, functionality, quality, cost effectiveness and global chart coverage are prerequisite, very few chart suppliers can fulfil these demands. All services offered by C-MAP, however, fully correspond with these requirements.



C-MAP ENC Distribution Service

This brochure describes just one of the services in C-MAP's portfolio - distribution of official Electronic Navigational Charts (ENCs), which is a relatively recent issue that is rapidly gaining acknowledgement and acceptance in the maritime world. This brochure covers the following issues related to ENC distribution:

- Co-operation with national Hydrographic Offices is central to C-MAP strategy as they are the source of all data produced by C-MAP. One such co-operation is the agreement for the distribution of ENCs. The current regulations encourage the use of ENCs on an ECDIS (Electronic Chart Display and Information System), which on a SOLAS class vessel are the equivalent of official paper charts, given that certain conditions are satisfied.
- Official data is distributed in C-MAP's own format, CM-93/3, which has been type certified by the DnV. The co-operation with system manufacturers is vital in this process and C-MAP actively supports them in software development and the consequent distribution of C-MAP charts.
- One of the complementary benefits of C-MAP's ENC distribution service is the possibility to easily use the C-MAP dual fuel option. In addition, C-MAP offers Real Time Updating service (RTU) for automatically updating official ENCs by e-mail or the Internet.
- Finally, there is information regarding C-MAP Chart Catalogue, which is a software tool used to look at chart coverage and order licenses.

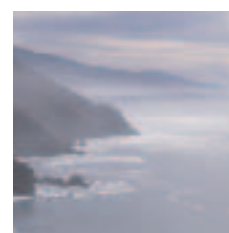
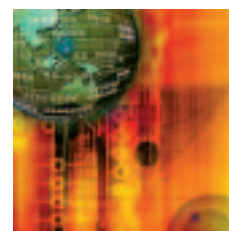
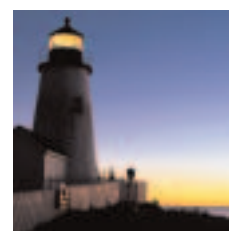


Chart Data Issued by National Hydrographic Offices

Co-operation with hydrographic offices

C-MAP's strategy of co-operating with Hydrographic Offices plays an essential part in achieving its objective of supplying a professional cartographic service, as they are the source of all data produced and distributed by C-MAP.

Among agreements to digitise national paper chart portfolios and to produce digital chart data for Hydrographic Offices C-MAP also has the permission to distribute official Electronic Navigational Chart data (ENC) produced by Hydrographic Offices.

C-MAP encourages and actively supports HO's in the production and distribution of ENCs. As data becomes available, C-MAP enters agreements with individual HO's in order to become an authorised distributor on behalf of national Hydrographic Offices. C-MAP aims to distribute a complete portfolio of ENC data and updating services from Hydrographic Offices.

The distribution of ENC data from Hydrographic Offices varies from country to country and depends upon the policy of individual HO's.



Regulations

A prime feature of ENC data is that it can replace the carriage requirements for paper charts on SOLAS class vessels when implemented in a type approved Electronic Chart Display and Information System - ECDIS and complimented by an updating service.

The principal regulation governing the content of a digital chart is S57, which is a data format for electronic charts defined by the International Hydrographic Organisation, the IHO. S57 is an exchange format used within the community of Hydrographic Offices and is used for the mutual exchange of chart data.

Type Approved Distribution Format

System ENC (SENC)

The format in which ENC data is distributed has been an issue that the Hydrographic Community has discussed for some time, the critical issues being protection and the implementation of data in the Navigation System.

In order to be displayed on a navigation system S57 data must be compiled into an internal format that can be displayed on Electronic Chart Display and Information Systems - ECDIS. This format is known as the 'System ENC' or SENC.

The International Hydrographic Organisation has ratified the concept of distribution of official ENC data in a SENC format. The Norwegian Hydrographic Service worked closely with Det Norske Veritas to define type approval requirements for distribution of S57 data in SENC format and C-MAP was the first company to have their SENC format type approved by DNV.

From an end-user's point of view the distribution of official data in a SENC format has the major advantage that there is no compilation of data required on-board when installing the data in the ECDIS system. Not only does this save time but it also means that the navigator on the bridge is never faced with the problem of handling errors that may arise in a compilation process. All compilation takes place in a controlled environment prior to distribution to the vessel. In the case of the SENC format developed by C-MAP, the data is encrypted and highly compressed which is a great cost saving advantage when data is transferred via satellite communications.



Support of system manufacturers

Another essential part of C-MAP's strategy, apart from the cooperation with Hydrographic Offices, is the support of chart systems manufacturers, as they form a direct link to end users.

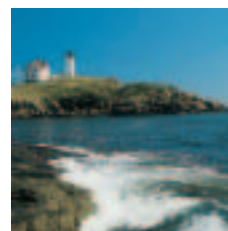
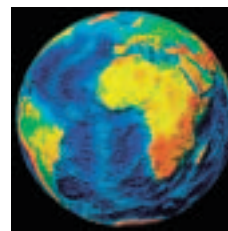
Support of manufacturers and end users is aimed at solving problems related to the implementation and distribution of digital chart data in compliance with IMO and IHO specifications. C-MAP offers system manufacturers software development kits for the implementation of electronic charts in their systems, and which then enable system manufacturers to provide cost effective distribution of chart data to end users. The fact that the majority of system manufacturers use C-MAP technology enables them to support and implement the SENC distribution concept.

C-MAP Additional Services

Dual fuel data

Global coverage of ENC data will take time to achieve. End users have the possibility of using other data produced by HO's and/or by commercial companies in areas not covered by ENC.

C-MAP produces and maintains the largest commercially available database of digital charts in the world. Data produced by C-MAP and ENC data from Hydrographic Offices are distributed in the same format which enables a unique dual fuel, vector-vector solution to end users in a System Electronic Navigational Chart – SENC, format which has also been type approved by DNV. It is important to note that data produced by C-MAP may not be used as a replacement for paper charts even if used in a type approved ECDIS system. This data however, facilitates the full functionality of an ECDIS system.



Coverage and availability

The production of official Electronic Navigational Charts - ENC by Hydrographic Offices has increased considerably and will continue to do so. Updated Information on the ENC coverage available from C-MAP is available on the C-MAP Norway website www.c-map.no.

Real Time Updating

Subscribers to C-MAP'S ENC service are provided with updated data on a CD on regular basis and incremental updates are available on request through the Real Time Updating service. The RTU service enables end users to access and upgrade data from C-MAP's central database using Internet or e-mail. Customers can download electronic charts and updates on demand, ensuring that the latest updated data is always displayed.

Communication technology and automatic updating services using the Internet and e-mail is leading edge technology used by C-MAP. The RTU infrastructure developed by C-MAP has been designed to meet IMO Performance standards for ECDIS systems and has been type approved by DNV.

How to get started

Chart Catalogue on web

The catalogue of chart distributed by C-MAP is available to download from Internet. This is a tool that can be used for ordering all electronic charts in CM-93/3 format, in both, pre-defined portfolios of zones and areas, and official ENC from Hydrographic Offices.

The chart catalogue is particularly useful for ordering ENCs. HO's supply ENCs in a cell structure whereby the customer is charged for each cell. The Chart Catalogue, however, has been designed to ease the ordering and handling of this cell structure.

Unlike the predefined portfolios, Chart Catalogue allows the user to limit the number of cells to any given voyage. The Chart Catalogue contains a route planner where the voyage can be planned. It also provides an overview of all charts necessary for the voyage and the coordinates of each waypoint. Once the route is planned and the "order" button pressed, the programme calculates the total cost of the charts based on the prices for the various ENCs. Once C-MAP receives the order all chosen ENC cells will be converted to a tailor made portfolio of charts, which requires only one password for the whole file.

If you would like to receive more information about C-MAP ENC distribution service please contact us at:

C-MAP Norway AS

Hovlandsveien 52
4379 Egersund

Tel: +47 51 46 47 00
Fax: +47 51 46 47 01
e-mail: market@c-map.no
website: www.c-map.no

