MOXA®
Reliable Networks ▲ Sincere Service

ECDIS Navigation System

Over the next few years, around 48 thousand ships will undergo an ECDIS navigation upgrade requiring extensive retrofitting of marine computing systems

Introduction

With the guidance of the International Maritime Organization, since 2009 commercial maritime ships have undergone a mandated shift to the ECDIS navigation system. ECDIS is a strictly regulated bridge information system that brings together a ship's charts, sensors, and navigational instruments into a single interface, giving the bridge crew greater awareness of the ship's position, heading, and immediate environment than has yet been possible. The IMO already requires all new commercial ships to be equipped with ECDIS, and beginning in 2012 it has started to enforce this requirement on existing ships, as well. By 2017, all commercial maritime vessels will be required, by international mandate, to be equipped with ECDIS.
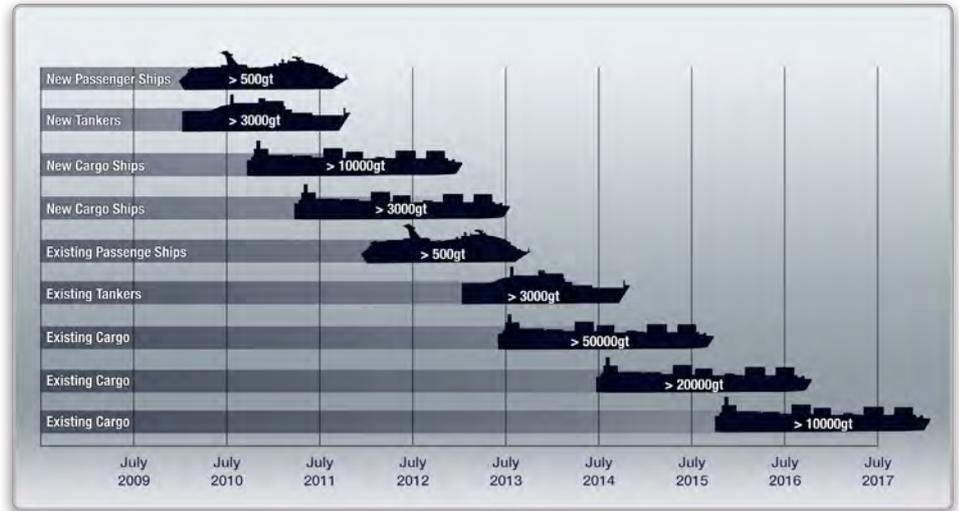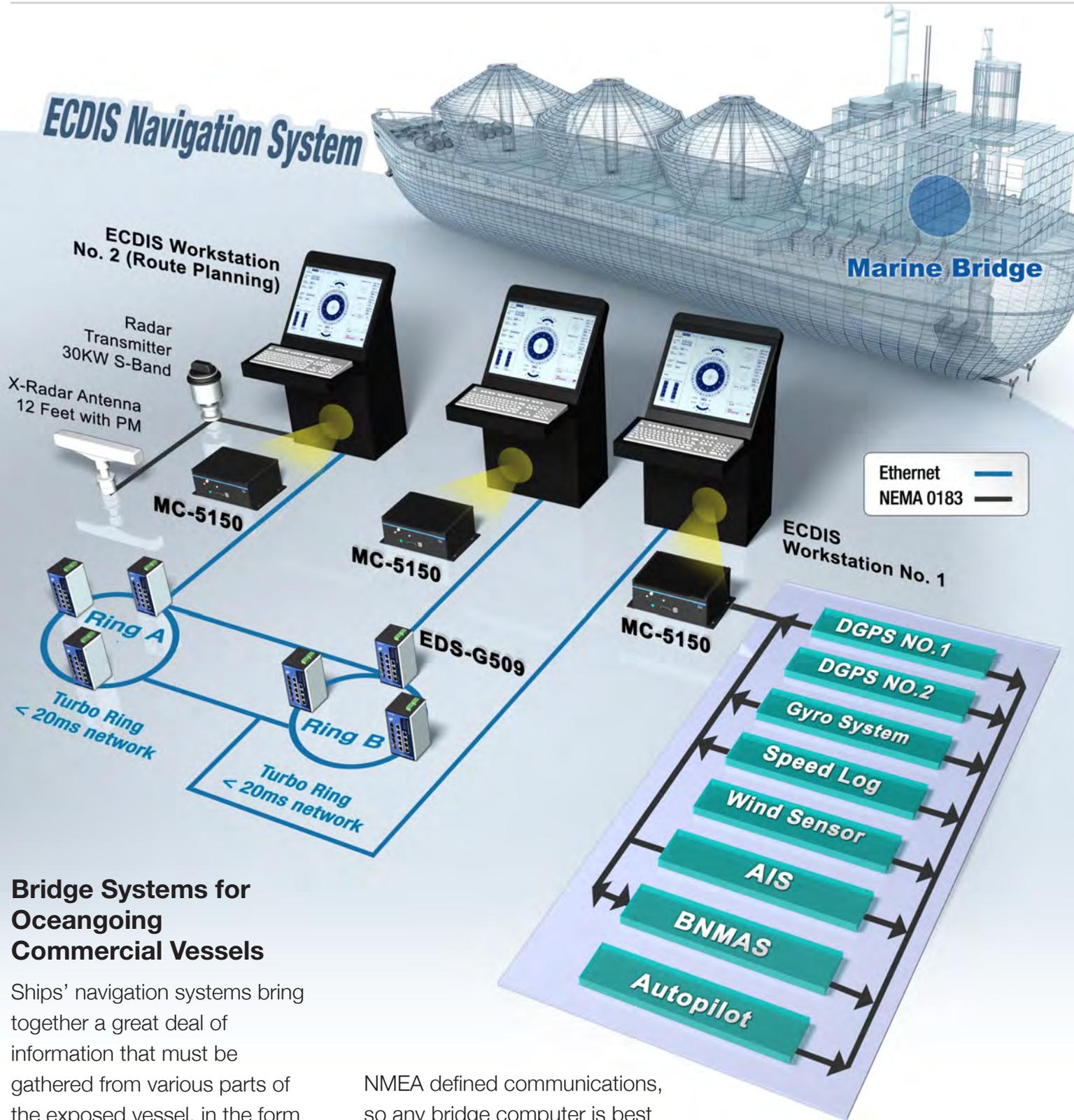

What is ECDIS?

ECDIS stands for Electronic Chart Display and Information System, but it goes much further than a digitized collection of charts. ECDIS combines all of a ship's real-time sensors (such as the speed log, radar, wind station, AIS, and gyrocompass) into a computer network that collects all the available information, analyzes it for anomalies and threats, and then displays this information in various views superimposed over detailed charts. ECDIS is the backbone of the next generation of navigation systems, providing bridge crews with real-time information about their location, surroundings, and underwater hazards in a way that has never been possible before.

As of July 2012 ECDIS has been mandatory for all new vessels, and over the next 5 years ECDIS will be installed on every other existing commercial maritime ship in the world. Estimates for the number of ships which still require ECDIS refurbishment run as high as 50 thousand, indicating that this is a huge, locked-in market for marine hardware suppliers. ECDIS systems require not only computers and switches specifically engineered for the difficult environments found on board commercial ships, but also must meet rigorous color performance standards on its display terminals. Whether speaking of durability, reliability, or performance, ECDIS systems pose formidable engineering and design challenges.

ECDIS Navigation System

Marine Bridge

ECDIS Workstation No. 2 (Route Planning)

Radar Transmitter 30KW S-Band

X-Radar Antenna 12 Feet with PM

MC-5150

MC-5150

EDS-G509

MC-5150

ECDIS Workstation No. 1

Ring A

Turbo Ring < 20ms network

Ring B

Turbo Ring < 20ms network

Ethernet	
NEMA 0183	

DGPS NO.1

DGPS NO.2

Gyro System

Speed Log

Wind Sensor

AIS

BNMAS

Autopilot

Bridge Systems for Oceangoing Commercial Vessels

Ships' navigation systems bring together a great deal of information that must be gathered from various parts of the exposed vessel, in the form of anemometer stations, speed logs, weather stations, and GPS. Most of the sensors involved are located outside the protected area of the bridge and hull, out in the open elements. Nearly all of these systems are connected via NMEA defined communications, so any bridge computer is best equipped with NMEA interfaces that allow reliable, direct, real-time communications with the required sensor systems. The computers that receive and analyze this data must be easily capable of processing multiple, high-bandwidth real-time serial IA data streams.

Additionally, however, all bridge systems should be both strongly redundant and also in full IT communications with the rest of the ship. What this means in

MOXA®

Reliable Networks ▲ Sincere Service

practice is that the ship-wide network will require multiple, rugged Ethernet switching and routing points that are distributed across several decks, throughout the hull and conning tower. To guarantee dependable communications, the ship's network should utilize redundant ring technology backed up by multiple alternate routes and certified for maritime standards like DNV and ABS. These on-board communications networks should further be able to incorporate digital input and output and IA serial interfaces (including NMEA), so that real-time alarms and failsafes may be configured for emergency notifiation.

Finally, all control terminals for the ECDIS system will require displays that strictly meet IMO-mandated color and luminance accuracy.

Customer's Quote: "[The] result is as expected. This is a totally reliable product and I have full confidence that the Moxa marine ECDIS PC and display panel will increase our reputation [for] quality on the market."

Why Moxa?
Computer/Display/Panel PC

- Type-approved maritime computers,displays, and panel PCs

- In-house control of design for guaranteed quality

- High performance processors

- High MTBF with extended warranties guarantees dependable availability

- Fanless, fully enclosed hardware eliminates common points of failure and cuts environmental wear and tear

- Comprehensive interfacing for easy connections: NMEA 0183, Ethernet, digital I/O, and more

- Professional and flexible customizations with reliable and efficient after-sales service

- Moxa's product revisions eliminate design flaws before the next production run begins, maximizing the design potential for every series of devices and guaranteeing increasing ROI over time

Switch

- Turbo Ring <20ms network recovery ensures high network availability.

- DNV/GL/ABS/LR/NK-certified industrial Ethernet switches for maritime applications.

- Standard conformal coating service to prevent salt and chemical corrosion

- Gigabit bandwidth for a shipwide communication backbone

❯ Product Highlights

MC-7130-MP
ECDIS computer with 3rd Gen. Intel® Core™ i3-3120ME 2.4GHz processor

MC-5150 series
ECDIS computer with 1st Gen. Intel® Core™ i5-520E 2.4GHz processor

MD-124 / MD-119
24/19-inch wide screen marine display with advanced viewing optimizations

EDS-G509
9G-port full Gigabit managed Ethernet switches

EDS-205A/208A Series
5 and 8-port unmanaged Ethernet switches