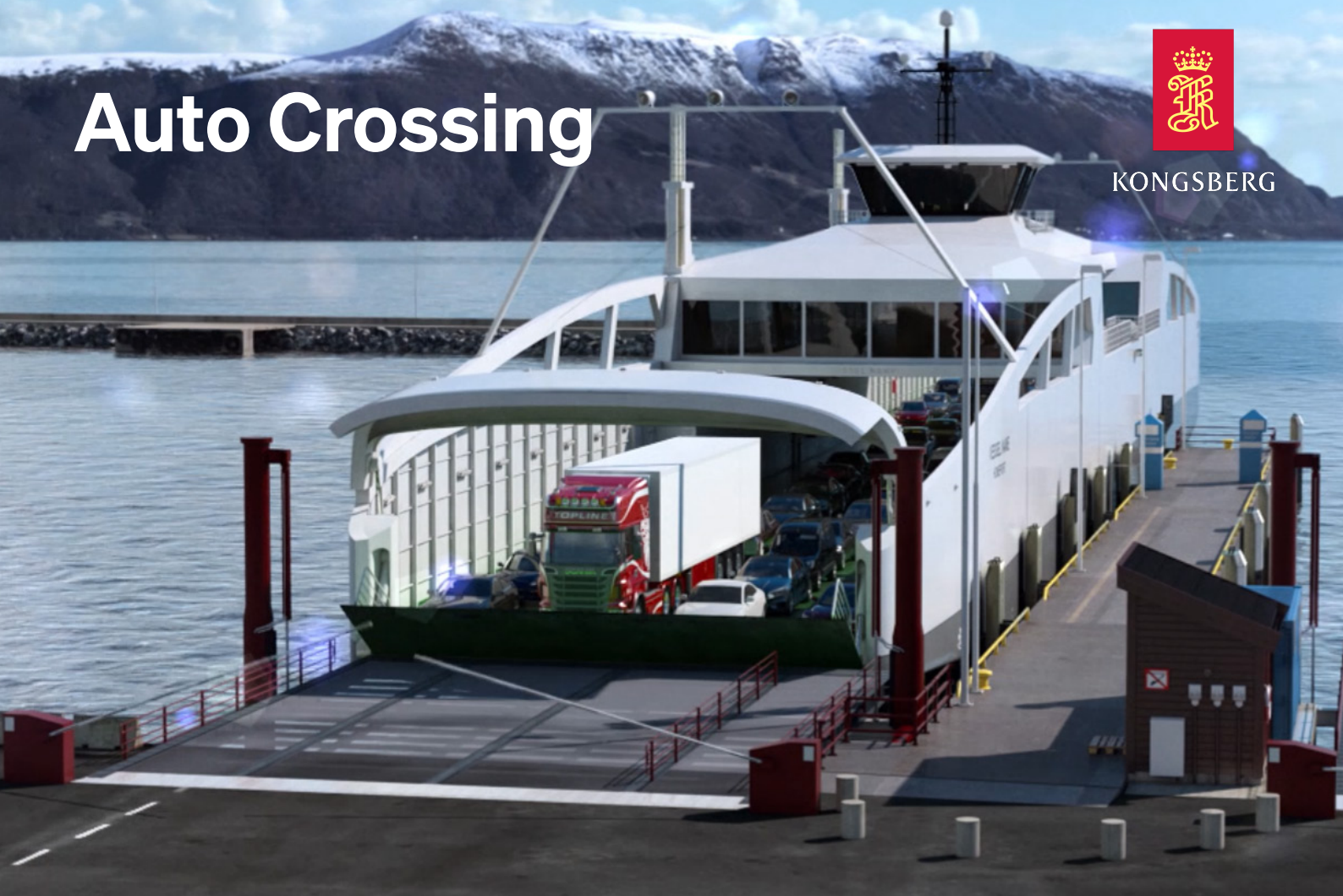


Auto Crossing



KONGSBERG



Efficient and predictable ferry crossing, every time

Auto Crossing

A ferry crossing comprises distinct phases of operation: departure from the dock terminal, acceleration to transit speed, deceleration, and arrival at the next terminal. Traditionally, the captain conducts these operations manually, resulting in variations of performance and utilisation of power and propulsion equipment.

The Auto Crossing system automates and optimises the ferry operation by providing automatic track and speed control from one landing point to another. A set of pre-defined routes are selectable. Transit speed is easily adjustable during the crossing, and estimated time of arrival is adjusted accordingly. The load distribution between the thrusters is continuously optimised based on environmental conditions, speed, and propulsion efficiency. Controllable pitch propellers will also be handled in an optimal relationship to the propeller speed.

HIGHLIGHTS:

- Predictable and stable energy consumption - through the tracking of predefined routes and a consistent speed profile
- Energy efficient thruster usage ensured by combining optimal RPM, pitch, and thrust for all steps of the crossing
- Controlled speed and crossing time, which can be easily adjusted to keep the scheduled crossing time
- AutoStop collision safety feature decelerating the vessel and keeping it in a predefined position if manual control is not resumed at the end of the automated journey
- Optional Auto Docking for fully automated crossings

Simple and intuitive operation

Shortly upon leaving the terminal, the single push of a button will activate the Auto Crossing function. The system accelerates the ferry to the desired speed on the selected route. During the crossing, the captain can adjust the transit speed and hence the arrival time.

Operational safety

When approaching the next terminal, the system notifies the captain when to take manual control. Motorised levers ensure correspondence between automatic and manual operation as the levers always follow the thruster order. Should the captain be unable to take control in the docking phase, the ferry will stop and automatically keep a fixed position and heading at a safe distance from the terminal. This feature contributes to safer ferry operations, avoiding ferries unintentionally colliding with fixed structures.

Multiple route management

The Auto Crossing system can be tailored to each ferry crossing with routes combining several ferries, and different night and day routes dependent on traffic demands. Auto Crossing supports multiple destinations, and varying ferry crossing schedules.

Expert know-how

The Auto Crossing concept combines Kongsberg Maritime's expert knowledge from different areas such as vessel control, propulsion control, propeller design, and propulsion hydrodynamics. Selecting the optimal system parameters will be based on detailed studies of the ferry hull, propeller dynamics, and crossing duration and location. As a result, the Auto Crossing system provides improved manoeuvring performance, reduced and predictable energy consumption, and enhanced operational safety.

System overview

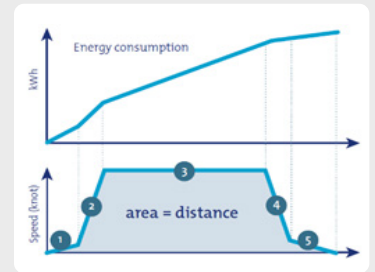
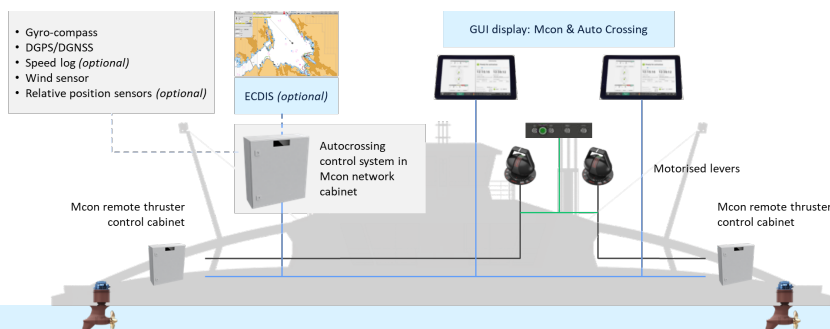
The Auto Crossing system is tightly integrated with Mcon, our latest propulsion and thruster control system. Both the propulsion and Auto Crossing functions are monitored through the common user interface. The control system comprises a dedicated control cabinet with interfaces to the Mcon thruster control system and standard navigation sensors (gyro and GNSS).

Optional Auto Docking

The Auto Crossing system can be extended to handle automatic docking, where the operator confirms the docking operation to initiate it. Adding this feature will automate the end-to-end ferry crossing. Additional sensors are required to enable the function (high-precision GNSS and gyro).

Optional Pause on Track

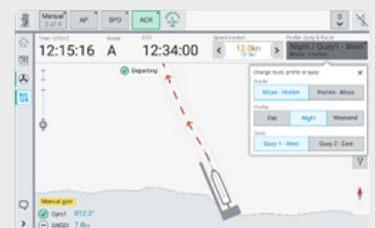
The Auto Crossing system can be extended with functionality to stop the ferry at any point of the voyage, for instance to wait for the quay to be ready for docking.



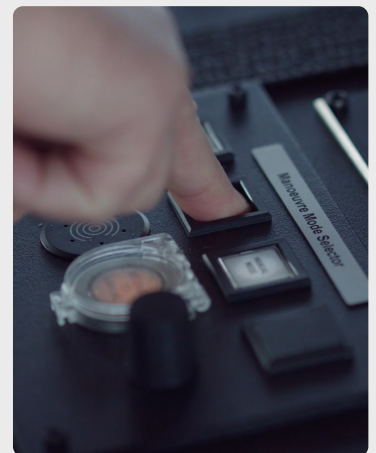
Energy and speed profile



One-day operation with Auto Crossing (Marine Traffic)



Combined Auto Crossing and thruster control interface



Available at the push of a button, Auto Crossing will ensure efficient, safe, and predictable journeys for optimised ferry operations.