



Navigating any vessel can be a challenging operation, especially when the mariner is facing difficult conditions like heavy traffic, dense fog or strong current. As ships grow ever larger, the challenge inflates. A “state of the art” ECS software application like Qastor, fed with reliable and accurate positioning and orientation data, offers the mariner a tool that can greatly improve his situational awareness, thereby easing the navigation task. In addition to basic information such as speed, heading, course over ground (COG), and rate of turn (ROT) that is shown in the Qastor side panel, probably the most important aspect for navigation is the chart.

### **Charts**

Qastor displays all the popular electronic chart systems like S-57, Primar, C-MAP, ARCS and DENC. Typically all charts show depth contours. Knowing the ship’s draft, the required safety margin for under-keel clearance (UKC), and the real-time tide value, Qastor will distinguish between safe and unsafe waters, and can do so simply by displaying depth areas in different colors. Of course the quality of the chart and the density of its contours dictate how accurately safe waters can be shown. Some ports produce and use “high-density” charts with contour intervals as small as 10cm. This means that a tide change of only 10cm is dynamically reflected in Qastor’s depiction of safe water. In this regard, high-density charts contrast starkly with the typical official charts obtained from a national hydrographic office, where the contour interval may be one or more meters. For these low-density charts, depiction of safe water does not change in Qastor until the tide has changed by 1 meter or more.

### **Route planning**

Route planning is fully supported in Qastor, from simple passages from A to B, to creation of an entire route network with multiple different end destinations. In large and complex ports, this level of route planning is ideal. Employing a route in Qastor yields all the necessary information, such as distance to the next waypoint, off-track distance, wheel over line, and much more. By entering all the relevant UKC parameters, Qastor will verify the viability of passage, highlighting on the chart all the sections of the route where it is not safe to navigate the vessel. Checking for dangerous areas can also be done during sailing. Qastor highlights on the chart any navigational hazards that encroach on these defined safety zones.

### **Positioning**

Taking speed, COG and heading into account, Qastor will predict the vessels path for a user-defined period of time. The accuracy of prediction depends on the quality of the positioning and navigation sensors feeding data to Qastor. If the pilot carries a high-end PPU, path prediction can be extremely accurate. Path prediction is used in combination with the “guard zone” to extend identification of potential hazards further forward of the vessel.

### **Situational awareness**

The mariner should of course be able to see the traffic around him. AIS integration is a standard feature of Qastor. All targets within VHF range are displayed in Qastor along with all the available information for each AIS target. The Qastor user decides how much of that available information is actually displayed. With a route selected, Qastor computes “closest point of approach (CPA)” for multiple targets thereby giving the

mariner an opportunity to adjust own vessel speed to dictate appropriate “meeting points”. Qastor’s provision of a “picture in picture” secondary chart window means the mariner can view conditions at other more distant parts of the route without losing sight of his own vessel on the main navigation display. This is a useful feature for monitoring busy areas along the route, for assessing CPAs or, for example, to determine whether the destination berth has been vacated.