Visual Feedback Specifications, v0.3

2018 Maritime RobotX Challenge   *www.robotx.org*

Background

Teams are required to implement a visual feedback system to indicate status of the Autonomous Maritime System (AMS). Such a system is requiredto improve the safety of our support operations. The purpose of this document is to describe a lighting system that will serve as a visual status indicator to the judges, staff, local observers and technical directors, of each team's unmanned system.

With unmanned systems being integrated into everyday use, it is safety critical for these systems to provide clear indication of their operational status to anyone in its vicinity. Resources and general guidelines will be outlined in this document so teams may acquire, integrate and test a system that meets the safety requirement set forth in the safety section of the 2018 Maritime RobotX Challenge Rules document.

Figure 1. Example visual indicators

Description

The lighting system shall consist of, at minimum, three lights: Red, Amber and Green or Blue. Lights shall be arranged in a vertically arranged configuration and mounted such that they provide a **360 degree daylight visibility**, when viewed from shore or nearby vessel (approximately 150 meters).

Lighting system colors shall correspond with the applicable mode of the team's autonomous system as indicated in Table 1, below. The lights may be flashing or steady on/off according to the state of the system.

Table 1: Light color and correlating modes

Color	Mode
Amber or Yellow	Tele-Operation / Manual Operation
Blue or Green	Autonomous operation
Red	E-Stop active (propulsion disabled)

Several visual indicator examples are shown in Figure 1, including off-the-shelf and custom LED array approaches. Keeping the below specifications in mind, design and selection of the final system is the team's decision.

Specifications

The maximum height dimensions and diameter of the lighting system are left to the discretion of the teams, depending on the amount of additional lights they want to add. However, the minimum height of the lighting systems shall be 12.5 cm. To provide visibility in sunlight, teams should use lighting systems which have clear enclosures for the light to shine through; rather than colored enclosures with standard light bulbs. The generic versions of these lighting systems are used indoors on machines and equipment for status indication across several industries and as such, are available globally. However, for the purposes of this competition, the technical directors will require teams to procure lighting systems that are visible in sunlight and can be observable from the shore and the on-water support craft (approximately 150 meters).

TEAMS NOTE: This is a Preliminary Draft of the Visual Indicator Specifications. Contact Aamir Qaiyumi, Maritime RobotX Challenge Technical Director, at Aamir.Qaiyumi@RobotX.org with questions, or post your questions on the RobotX Community Forum.