

TECHNICAL ORDERING DATA

6098-1400

Salient Characteristics: iO500 Intelligent Life Safety System Panel

The EST iO500 Intelligent Life Safety System Panel with XAL250 Loop Expander Card, SA-232/RS-232 Card, and 1 set of internally mounted 18A/H batteries provides two Class A analog device loops that support up to 500 device addresses. The RS-232 Card adds the ability to interface and program with a PC or laptop. Alarm panel contains an internal back-up of rechargeable battery power. The following software must also be included with the iO500: FUU_Setup(1), IO_023000, IO-CU_Setup, as well as 3101830-EN V3.5 IO-CU V3.5 and iO Panel Firmware V2.3 Release Notes.

Features

- Supports 2 Class A loops that support up to 500 intelligent devices: each loop supports up to 125 detectors and up to 125 modules. Each loop shall have 4(ea) electrical connectors for quick-disconnect connections at the panel, 2(ea) for loop input and 2(ea) for loop output. See the following for total items to attach to iO500 panel:
 - 4(ea) 12 Inch length cable – 16 AWG, 2 conductors, 19 strands tinned copper wire, PE insulation, a stranded tinned copper drain wire, with a tinned copper braid shield, non-woven tissue wrap binder and an overall Low Smoke Zero Halogen Polyurethane jacket, Red Overall Cable Jacket Color
 - 4(ea) watertight cable entry tubes – Type Hubbell # SHC1018
 - 2(ea) 2 Position Cable Connector – CBGV4DS-SB2-14S-9PC
 - Pin A: Red
 - Pin B: Black
 - 2(ea) In-Line 2 Position Cable Receptacle – CB1DSSB2-14S-9SC
 - Pin A: Red
 - Pin B: Black
- Supports Signature Series intelligent modules and detectors
- Electronic addressing with automatic device mapping
- Supports Genesis horn silence over two wires and UL 1971-compliant strobe synchronization
- Adjustable detector sensitivity
- 4 X 20 character backlit LCD display
- RS-232 communications port provided for advanced systems configuration or to upload systems reports via laptop
- Password protected
- Displays smoke and heat detection as separate trouble indications per each detector location
- Software
 - FUU_Setup(1): Firmware Update Software
 - IO_023000: Firmware File
 - IO-CU_Setup: Panel Configuration Utility
 - 3101830-EN V3.5 IO-CU V3.5 and iO Panel Firmware V2.3 Release Notes

6.1 TEMPORARY INSTALLATION OF AUTOMATIC FIRE DETECTION SYSTEM.

6.1.1 Applicability. An automatic fire detection system meeting the requirements of this chapter shall be temporarily installed on commissioned submarine availabilities where habitability is being disestablished and the crew moved off hull, as a minimum, to alert personnel of fires onboard.

6.1.1.1 The system shall consist of individually-addressable combination smoke and heat detectors located throughout the submarine which are powered and monitored by an alarm panel. The system shall automatically detect and alarm for smoke and/or high temperature conditions, and shall identify the specific location of the detector in alarm. The alarm panel shall be located in a continuously-manned topside watch area (e.g., CASCON Station), protected from inclement weather, and fully field programmable by the end-user. The automatic fire detection system shall be stand-alone and separate from the CASCON system itself.

6.1.1.2 A capability needs to exist to detect fires via automatic detection or visual watch-standing and respond to these fires with extinguishers or a hose reel within ten minutes.

6.1.1.3 Based on shipchecks quantities of detectors were estimated to be at most 150 detectors per a submarine.

6.1.2 Combination Smoke and Heat Detector Hardware Requirements.

6.1.2.1 The combination smoke and heat detectors shall be Underwriters Laboratories (UL). The combination smoke and heat detectors shall also be UL-listed for use with the alarm panel. The heat detector portion of the combination smoke and heat detector shall have a minimum UL-listed spacing of 30 feet.

6.1.2.2 The following design criteria shall be met:

- a. Combination smoke and heat detectors shall be spot-type and be restorable after alarm only after a reset of the latched audible and visual alarm at the alarm panel is manually executed. A non-restorable fusible alloy is not permitted as the operating mechanism of the heat detector portion of the combination detector. Combination smoke and heat detectors in alarm shall cause audible and visual alarms to occur at the alarm panel, but shall not initiate audible and visual notification appliances throughout the submarine. Combination smoke and heat detectors shall not generate an audible alarm themselves (i.e., detector sounder bases shall not be used).
- b. The heat detector portion of the combination smoke and heat detector shall have a fixed temperature alarm threshold of 135°F. The smoke detector portion of the combination smoke and heat detector shall be the photoelectric light scattering type and have at least two programmable sensitivity settings and shall be programmed and installed using the least sensitive alarm threshold (i.e., the highest percent obscuration per foot sensitivity setting). Ionization smoke detection shall not be permitted for the smoke detection portion of the combination smoke and heat detector.
- c. The combination smoke and heat detector shall consist of the detector head as well as the detector's base and a watertight junction box. The watertight junction box shall contain at least two mounting holes/tabs to allow for the installation of the detector in the overheads using approved fastening hardware. Each combination smoke and heat detector shall have at least one Light Emitting Diode (LED) which shall identify that power is being supplied to the detector and shall also identify, in a different visual way (e.g., separate LED or indicator, one LED capable of two colors, LED flashing versus steady, etc.), when the detector is in an alarm state. Each combination smoke and heat detector base shall contain a short circuit isolator that shall protect all other detectors on the looped detector power and monitoring cabling from any cable conductors that are accidentally shorted.

6.1.2.3 The automatic fire detection system shall be installed in a looped configuration such that a cable break/open anywhere in the loop allows the alarm panel to continue to power and monitor all detectors from both sides of the remaining loop portions, while also providing a trouble indication that there is a break in the looped cabling. The watertight junction box shall have electrical connectors to allow for quick-disconnect connections of the incoming and outgoing detector power/monitoring cabling, where the cabling has the mating electrical connectors.

6.1.3 Alarm Panel Hardware Requirements.

6.1.3.1 The following design criteria shall be met:

- a. The alarm panel shall be capable of powering and monitoring at least 200 addressable detectors. The alarm panel shall be capable of powering at least four loops of detectors in a Class A style. The alarm panel shall contain an internal back-up rechargeable battery power source, capable of operating the alarm panel for at least 24 hours if primary 120 VAC, 60 Hz power is lost.
- b. When a combination smoke and heat detector alarms, the alarm panel shall be capable of identifying and displaying whether the smoke portion of that detector alarmed or the heat portion of that detector alarmed. The alarm panel shall also be capable of temporarily disabling only the smoke portion of any one or a group of detectors, while leaving the heat detection portion of that one detector or a group of detectors fully capable of responding and alarming to high temperatures. When such a disabling feature is employed, the appropriate trouble indication(s) shall occur at the panel for that/(those) detector(s) that lost its/(their) smoke detection capability. The capability to disable any detector or feature of a detector shall be password protected.

6.1.3.2 The alarm panel shall have an alphanumeric display of at least 60 characters that can identify each specific combination smoke and heat detector when in an alarm state, as well as in a trouble state. The alarm panel shall be programmed such that when a detector goes into an alarm or trouble state, the name of the space (where the detector is located) is displayed in the alpha-numeric display of the alarm panel, as well as additional information that can accurately identify the location of the specific detector in an alarm or trouble state. This additional information displayed about the detector shall include at least the frame number where the detector is installed, the level of the space (for multi-level spaces), and the relative location of the detector at that frame number (e.g., port, centerline, or starboard), as well as the detector's assigned numerical address number and (for detectors in alarm) whether the smoke or heat portion of the detector is in an alarm state.

6.1.4 Automatic Fire Detection System Installation Criteria. Combination smoke and heat detectors shall be installed in the overheads of the spaces throughout the submarine using the following criteria:

6.1.4.1 Combination smoke and heat detectors shall be installed in the overheads of the submarine spaces, using approved fastening.

6.1.4.2 Combination smoke and heat detectors shall not be located in any direct airflow or closer than 36 inches from an air supply diffuser or return air opening, where air can negatively influence the performance of the detector.

6.1.4.3 The following area coverage and spacing requirements shall be met:

- a. Smooth Overheads. For compartments or areas of the submarine with smooth overheads (where overhead beams or frames are less than or equal to four inches in depth), the distance between combination smoke and heat detectors shall not exceed their listed spacing of 30 feet (thus 900 ft² area coverage), even if the UL listed spacing for the heat detector portion of the detector is more than 30 feet. Combination smoke and heat detectors may be mounted on the smooth overhead itself or on the bottom of these beams. For any detectors mounted on the bottom of a beam, consideration shall be given to ensure that the detectors are not subject to damage from "normal" shipyard work, operations, and movements. For smooth overheads, one of the following requirements shall apply:
 - 1) The distance between detectors shall not exceed 30 feet, and there shall be detectors within a distance of 15 feet, measured at right angles from all bulkheads.
 - 2) For the "corners" of a space, all points on the overhead shall have a detector within a distance equal to or less than 21 feet (i.e., 0.7 times the listed spacing of 30 feet).
- b. Beamed Overheads.
 - 1) Beam depths less than 0.1 overhead height. Overhead height is defined as the distance from the deck to the solid overhead structure. For an arched overhead (e.g., upper level of the submarine), it is the highest distance, normally at the centerline). For overheads with beam depths of less than 10 percent of the overhead height (H) (i.e., 0.1H), smooth overhead spacing of 30 feet shall be permitted. Detectors shall be permitted to be located on the overhead or on the bottom of beams.

For any detectors mounted on the bottom of a beam, consideration shall be given to ensure that the detectors are not subject to damage from "normal" shipyard work, operations, and movements.

- 2) Beam depths equal to or greater than 0.1 overhead height. For overheads with beam depths equal to or greater than 10 percent of the overhead height (H) (i.e., 0.1H), the following requirements shall apply:
 - i. Where the distance (i.e., spacing) between the beams is equal to or greater than 40 percent of the overhead height (H) (i.e., 0.4H), detectors shall be located on the overhead in each beam pocket.
 - ii. Where the distance (i.e., spacing) between the beams is less than 40 percent of the overhead height (H) (i.e., 0.4H), smooth overhead spacing of 30 feet shall be permitted in the direction parallel to the beams, but one-half the smooth overhead spacing of 30 feet (i.e., 15 feet) shall be permitted in the direction perpendicular to the beams. Detectors shall be located either on the overhead or on the bottom of the beams. For any detectors mounted on the bottom of a beam, consideration shall be given to ensure that the detectors are not subject to damage from "normal" shipyard work, operations, and movements.
- c. Rectangular Compartments. In practical applications, few compartments on submarines are exactly square, with rectangular compartments more common. A detector with such 30 ft spacing can also cover a 25 ft x 34 ft area, or a 20 ft x 37 ft area, or a 15 ft x 39 ft area, or a 10 ft x 41 ft area, or any rectangular area contained within this circle. A compartment larger than any singular rectangle requires extra detectors. The proper placement of detectors in such larger compartments shall be obtained by breaking down the larger compartment into multiple rectangles. In general, all points in the overhead of a compartment should have a detector within a distance of 0.7 times the selected spacing. For irregularly shaped areas, the spacing between detectors shall be permitted to be greater than the listed spacing, provided the maximum spacing from a detector to the farthest point of a bulkhead or corner is not greater than 0.7 times the listed spacing.

TECHNICAL ORDERING DATA

6098-1413

Salient Characteristics: RLCD-C Remote Annunciator

The EST Fire & Safety Annunciator provides status indication and common controls for the iO500 Fire Alarm Control Panel (FACP). Annunciators include a back-lit, 4 X 20 character per line, liquid crystal display (LCD). Each unit configured for Class A communication with RS-485 wiring.

Features

- Supports iO500 FACP remote indication and common controls
- 4 X 20 character backlit LCD display
- RS-485 wiring
- Class A configuration