EyeOnBoard Design
78E Marlow Yacht

Table of Contents

EyeOnBoard LLC designs, builds and markets custom yacht monitoring systems. Through a diverse array of sensors, live video images, and multiple communication options our system provides owners visible access to their yachts while moored at a marina, at anchor or underway anywhere in the world. The EyeOnBoard objective is to deliver 24/7 peace of mind to yacht owners by focusing on security, safety, asset protection, and reduced repair expenses.

The system uses numerous communication technologies such as WiFi, orbiting satellites, stationary satellites, or cellular data service to communicate with the central information management system. When multiple communication capabilities are installed, the system will choose the most cost effect link based on the type of information transmitted.

Our system performs security and safety monitoring, environmental monitoring, and video surveillance. All aspects of the system can be controlled and/or viewed from any PC with a web browser world wide. No special software is required. This includes the viewing and positioning of the onboard tilt, pan, and zoom cameras, arming and disarming of the alarm system and managing system control parameters.

At the owner's choosing the system will automatically transmit the vessel's location to a predetermined list of recipients along with a personal message. The yacht's actual position can be viewed on global satellite images using Google Earth technology.

As part of the total yacht monitoring service, a 24/7 staffed Yacht Response Center monitors the yacht and responds to all alerts generated by the system. The Center is also there to answer questions about the operation of the system and performs computer maintenance activities to minimize computer down time or data loss.

To experience the systems complete functionality, or to discuss a custom system configuration please contact us at 916-933-5709 or 604-512-0077. Additional information is also available at WWW.EyeOnBoard.com

Deck Layout
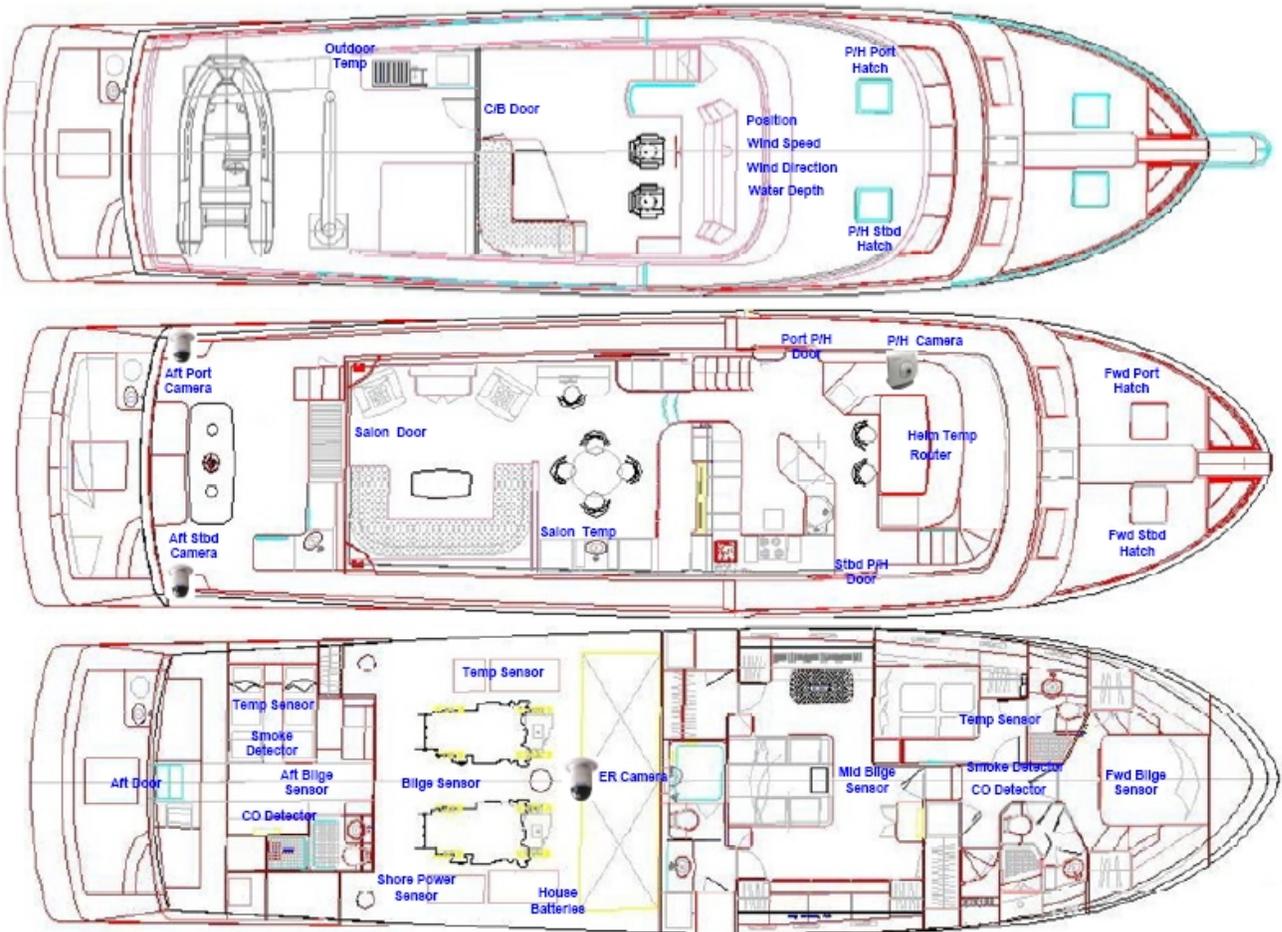
EyeOnBoard Architecture
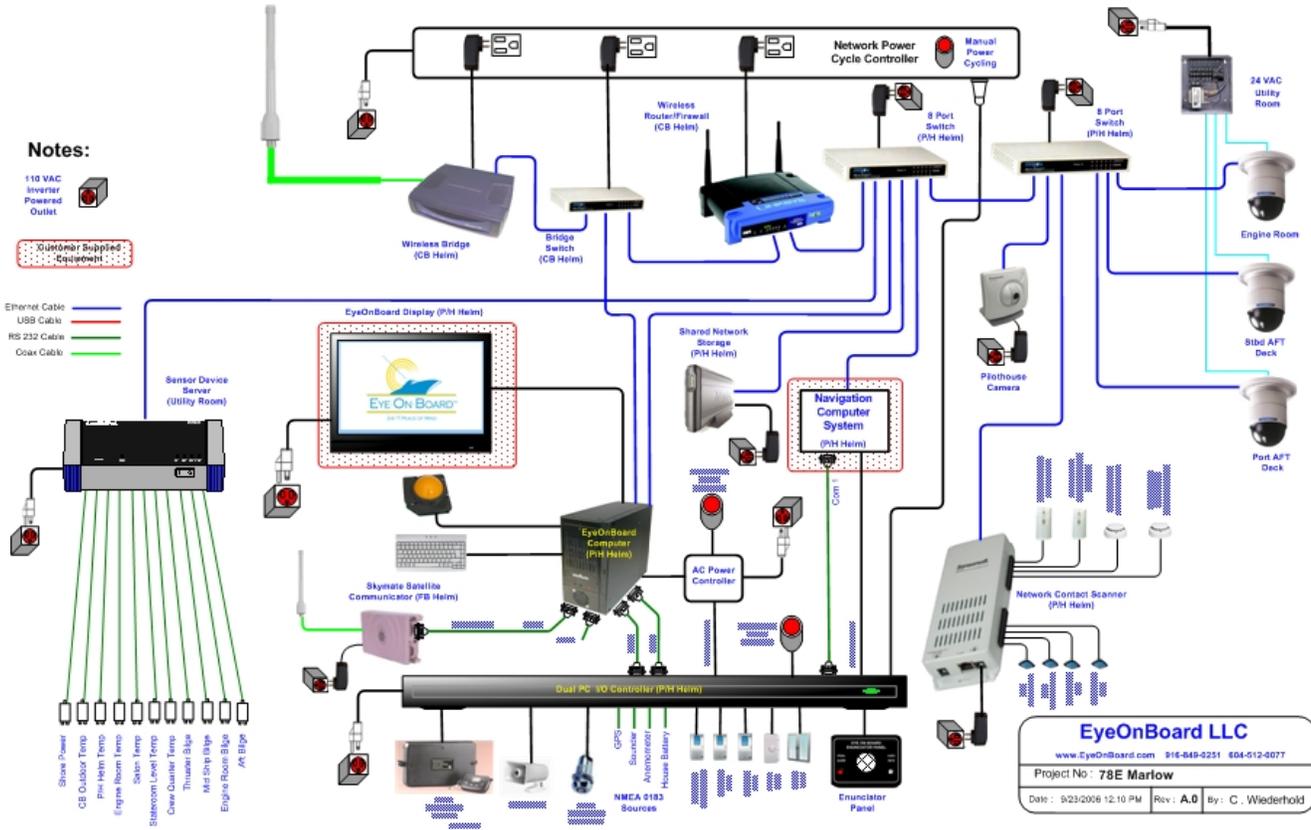
On-Board System Features

Security and Safety Monitoring Locations

Port forward hatch	Stbd forward hatch
Port pilothouse hatch	Stbd pilothouse hatch
Port pilothouse door	Stbd pilothouse door
Command bridge door	Aft turret door
Salon door	Tamper Monitoring
Crew quarter CO & smoke detectors	Stateroom CO & smoke

GPS Fence (requires onboard GPS) will generate alerts if the vessel changes position while the security system is armed

Environmental Monitoring Locations

AC shore power loss	Aft bilge flooding
Outside temperature	Engine room bilge flooding
Pilothouse helm temperature	Mid ship bilge flooding
Engine room temperature	Forward bilge flooding
Salon Temperature	Staterooms temperature
Crew quarter temperature	

Dockside Communication System

802.11B Wi-Fi compliant
Site Survey to identify available Wireless networks
400 mw signal strength
Over 1000 feet line of site Range
54 GB private and secure on-board wireless network

Underway Communication System

Orbcom Orbiting satellites – Skymate 100 system
Text mail and text weather, real time position reporting with graphics
Automatic switch over of all EOB monitoring services if Wi-Fi fails or is not available (except video feeds)

Security System Controls

Arm/disarm alarm system over the internet

Key alarm arm/disarm	Keyless alarm arm/disarm
Enunciator panel	External siren

Video Camera System

Port aft deck t/p/z camera   Stbd aft deck t/p/z camera
Engine room t/z/s camera   Pilothouse t/p camera
Onboard or via the internet - full viewing with tilt, pan, and zoom
control of each camera

NMEA Data Information Display

Position - GPS
Water depth and temperature - sounder
Wind speed, direction, and outside temperature – anemometer
(Ultrasonic anemometer) required
House batteries condition – voltage, current, %charged

Computer System

Industrial grade computer design
50 degrees C operating temperature
Single board computer technology
Pentium class processor
80 GB storage
24x CD-ROM reader
Small foot print 8"x10"x4
Windows XP professional
Scheduled data backup system
200 GB network storage for system wide auto backup
Remote local power on/off switch
Over the internet pc power cycling
Wireless keyboard & surface mounted trackball

Yacht Owners Web Site

Yacht Layout with Sensors and NMEA Information
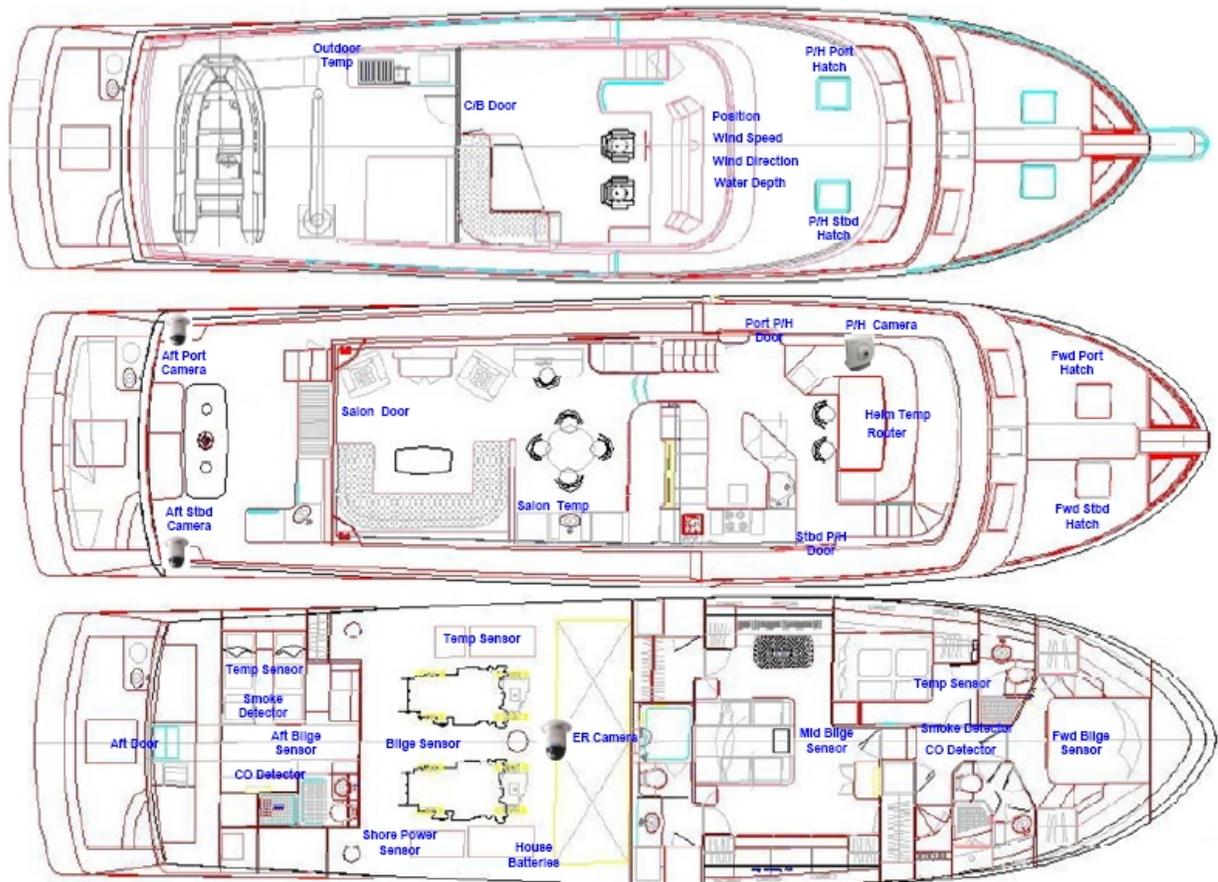
❖ Single and simple view of all monitored sensor and navigation equipment data

❖ Information updated every 10 minutes

❖ Sensor text color changes when a alarm condition is detected

❖ Sensor or NMEA information can be expanded by clicking on text

❖ Layout customized for each owners yacht

Sensor and NMEA Information Detail

NMEA Device Readings for Persuasion

Snapshot taken at **2006-02-17 09:50:36 (PST)**
Snapshot received at **2006-02-17 09:52:04 (PST)**
Snapshot displayed at **2006-02-17 09:52:23 (PST)**

Device Reading
Position: N49 17.5450 W123 7.5770
Water Depth: 20.8 feet
Depth Statistics: Today (min/max) 0.2/22.4 Yesterday (min/max) 0.0/197.0
Wind Direction: NE (57 degrees)
Last Hour Gust: 18.7 Average: 8.6
Yesterday Gust: 22.8 Average: 6.3
Today Min: 2 Max: 78 Avg: 36
Volts This Hour Min/Max: 13.6/13.7 Last Hour: 13.6/13.7 Today: 13.6/13.7 Yesterday: 13.6/13.7
Amps This Hour Min/Max: -2/2 Last Hour: -2/2 Today: -2/2 Yesterday: -2/3
Battery Charge This Hour Min/Max (% of 1500 Amp Hour capacity): 100/100

Device Details
GPS Mode: Diff GPS Satellites: 06
Water Temperature: 45.9 F
Wind Speed: 11.8 Knots
This Hour Gust: 21.2 Average: 11.9
Today Gust: 26.5 Average: 13.4
Air Temperature: 38 F
Volts: 13.7
Amps: 1
Battery Charge: 100%

SensorSoft Readings for Persuasion

Snapshot taken at **2006-02-17 09:52:00 (PST)**
Snapshot received at **2006-02-17 09:52:04 (PST)**
Snapshot displayed at **2006-02-17 09:52:23 (PST)**

Security system is **armed** at 2006-02-17 09:51:13

Status	Sensor	Reading	Reading At
Normal	Main Vessel AC Power	PWR OK	Fri Feb 17 09:51:23 2006
Normal	Thruster Bilge	DRY	Fri Feb 17 09:51:26 2006
Normal	Mid Ship Bilge	DRY	Fri Feb 17 09:49:53 2006
Normal	Engine Room Bilge	DRY	Fri Feb 17 09:50:28 2006
Normal	Lazaratte Bilge	DRY	Fri Feb 17 09:50:40 2006
Normal	Bunk Room Temperature	49.1 F	Fri Feb 17 09:48:24 2006
Normal	Helm Temp	58.1 F	Fri Feb 17 09:51:18 2006
Normal	Salon Temperature	43.7 F	Fri Feb 17 09:47:35 2006
Normal	Fly Bridge Temperature	36.5 F	Fri Feb 17 09:48:49 2006
Normal	Engine Room Temperature	42.8 F	Fri Feb 17 09:51:27 2006
Normal	Lazaratte Temperature	42.8 F	Fri Feb 17 09:48:55 2006
Normal	Salon Camera	UP	Fri Feb 17 09:44:15 2006
Normal	I/O Server	UP	Fri Feb 17 09:47:16 2006
Normal	Network Router	UP	Fri Feb 17 09:51:04 2006

Monitored Contact Readings for Persuasion

Snapshot taken at **2006-02-17 10:00:15 (PST)**
Snapshot received at **2006-02-17 10:02:04 (PST)**
Snapshot displayed at **2006-02-17 10:02:26 (PST)**

Security system is **armed** at 2006-02-17 10:00:15

Status	Sensor	Reading	Last Change At
Normal	Salon Door	CLOSED	2006-02-13 12:45:43

❖   Sensor and NMEA information viewed with supporting detail

Communication Link Performance

### Check-In Statistics for Persuasion

Vessel: **Persuasion** Monitoring Status: **Active** Service Level: **EyeWatch (Monitored Warn)**
Now: **2006-02-17 10:18:08** Last Check-Over: **2006-02-17 10:15:01**

Current Status: **Normal**   Last Action: **Panic**   Last Connection: **WiFi**
At: **2006-02-17 10:16:03**   At: **2006-02-13 09:50:00**   At: **2006-02-13 14:29:33**

Recent Check-Ins   **Recent Actions**   **Recent Connections**

Recent Check-Ins	Recent Actions	Recent Connections
2006-02-17 10:16:03	2006-02-13 09:50:00 - Panic	2006-02-13 14:29:33 - WiFi (3.8 days)
2006-02-17 10:01:03	2006-02-13 09:20:01 - Warn	2006-02-13 13:38:01 - SkyMate (52 minutes)
2006-02-17 09:46:03	2006-02-11 12:50:01 - Panic	2006-02-13 13:04:15 - WiFi (34 minutes)
2006-02-17 09:31:03	2006-02-11 12:20:00 - Warn	2006-02-13 07:53:45 - SkyMate (5.18 hours)
2006-02-17 09:16:03	2006-02-06 03:20:00 - Panic	2006-02-11 10:56:58 - WiFi (1.9 days)
2006-02-17 09:01:03	2006-02-06 02:50:00 - Warn	2006-02-11 10:42:52 - SkyMate (14 minutes)
2006-02-17 08:46:03	2006-02-04 09:35:00 - Warn	2006-02-04 09:40:40 - WiFi (1 week)
2006-02-17 08:31:03	2006-02-02 02:35:01 - Panic	2006-02-04 08:26:25 - SkyMate (1.23 hours)
2006-02-17 08:16:03	2006-02-02 02:05:00 - Warn	2006-01-20 17:50:42 - WiFi (2.1 weeks)

Check-In Performance from 2005-07-17 00:01:30   **Connections** over 6.2 months
This analysis is based on an expected check-in frequency of thirty   Isolated: 0%, WiFi: 94%, SkyMate: 6%
minutes, give or take two minute(s).

Interval	Up Time	Outage Duration
Today (10.3 hours)	100%	zero minutes
Yesterday (1 day)	100%	zero minutes
Last Seven Days (7 days)	94.6%	9.02 hours
This Month (16.4 days)	92.2%	1.3 days
Last Month (31 days)	97.4%	19.61 hours
Last Six Months (184 days)	93.2%	12.6 days

Action Ratings from 2005-07-17 00:01:30
Ratings range from zero (bad) through ten (great).

Interval	Rating	Panics	Warnings
Today (10.42 hours)	10	0	0
Yesterday (1 day)	10	0	0
Last Seven Days (7 days)	9.6	2	2
This Month (16.4 days)	9.7	4	5
Last Month (31 days)	9.8	4	7
Last Six Months (184 days)	9.7	34	79

❖ Track wireless connectivity performance

❖ Track which wireless communication service is most frequently used

❖ Automatic selection of the most cost effective wireless service available

Yacht Owners Web Site

Onboard Camera Images

Roche Harbor received at 2006-02-17 10:42:34 (PST)

Vancouver Kat Cam received at 2006-02-17 10:41:28 (PST)

Zalophus received at 2006-02-17 10:43:54 (PST)

Cockpit TPZ Camera received at 2006-02-17 10:44:05 (PST)

Engine Room Camera received at 2006-02-17 10:44:05 (PST)

Salon Camera received at 2006-02-17 10:44:05 (PST)
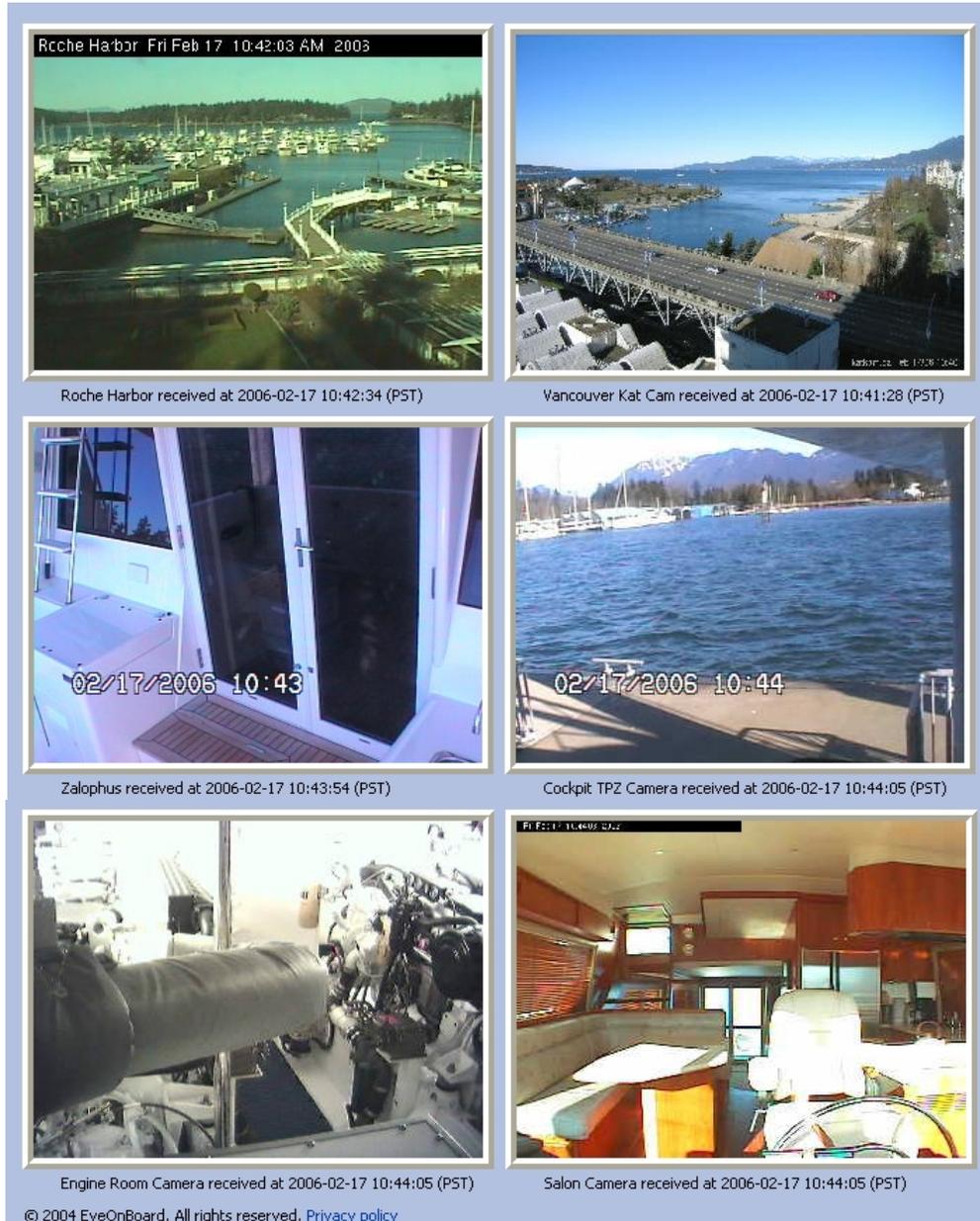
❖ Top row images are owner specified web cam photos

❖ Remaining rows are onboard cameras images

❖ Images are updated every 10 min

Yacht Owners Web Site

Onboard Camera Control

- ❖ Each onboard camera can send live images up to 120 frame per minute (FPM), depending on available network performance

- ❖ Camera image can be zoomed in or out

- ❖ User defined presets provide rapid camera positioning

- ❖ The tilt, pan, zoom cameras can be controlled by the owner in real time via the EyeOnBoard web site

- ❖ Multiple people can view and control the camera simultaneously from different computers

- ❖ All data and camera images can be viewed world wide from any Windows XP based computer

Yacht Owners Web Site

System Configuration Page

Operational Settings for Persuasion

Monitoring Configuration
- ☑ Check-In Monitoring Enabled
- ☑ On Board Cameras Active
- ☑ Guest Camera Control Enabled
- ☑ NMEA Upload Monitoring Enabled
- ☑ SensorSoft Upload Monitoring Enabled
- ☑ Monitored Contact Upload Monitoring Enabled

Security system is currently **armed.**   Arm Disarm

Position Reports
Position reports are sent when new GPS data becomes available.

- ☐ Position Reporting Enabled

Send reports to (separated by commas)

rob@eyeonboard.com

A short message to include with position reports

Password: [_____]   Save changes

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❖ While underway check-in monitoring must be disabled unless satellite equipment is installed to prevent the system from report unnecessary communication link failures

❖ The onboard cameras can be deactivated to ensure onboard privacy

❖ Guest camera control can be turned off to prevent camera usage without knowledge of owners password

❖ NMEA data, sensor data, and contact scanner data transfers can be stopped to prevent unnecessary satellite traffic and resultant expense

❖ The security system can be armed or disarmed over the internet using a PC or browser based cell phone

Yacht Owners Web Site

Position Information

❖ Accurate Position information will always appear on the vessel layout page. While underway the same information can be shared with multiple parties along with a customized message. (requires one of the satellite system option to be installed) Reporting interval while underway is user defined. A satellite image of the vessel exact position will be displayed by clicking on the position information found on the vessel layout page or by opening the email message and selecting the image link in the message.

❖ The image below is that of a vessel traveling along the west coast of Mexico.
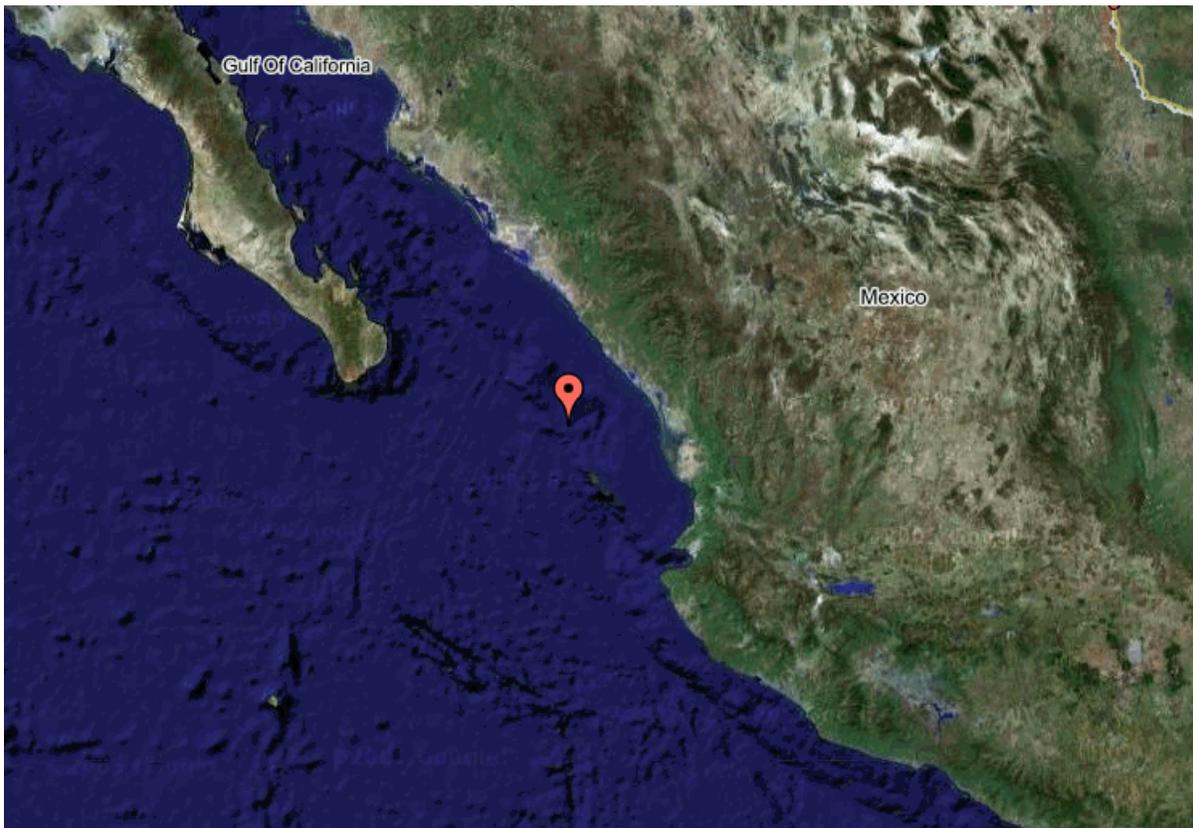
Yacht Owners Web Site

❖ The image below shows a vessel in Vancouver Harbour BC Canada. The user can also overlay street maps of the area. The user can also select various magnification setting.

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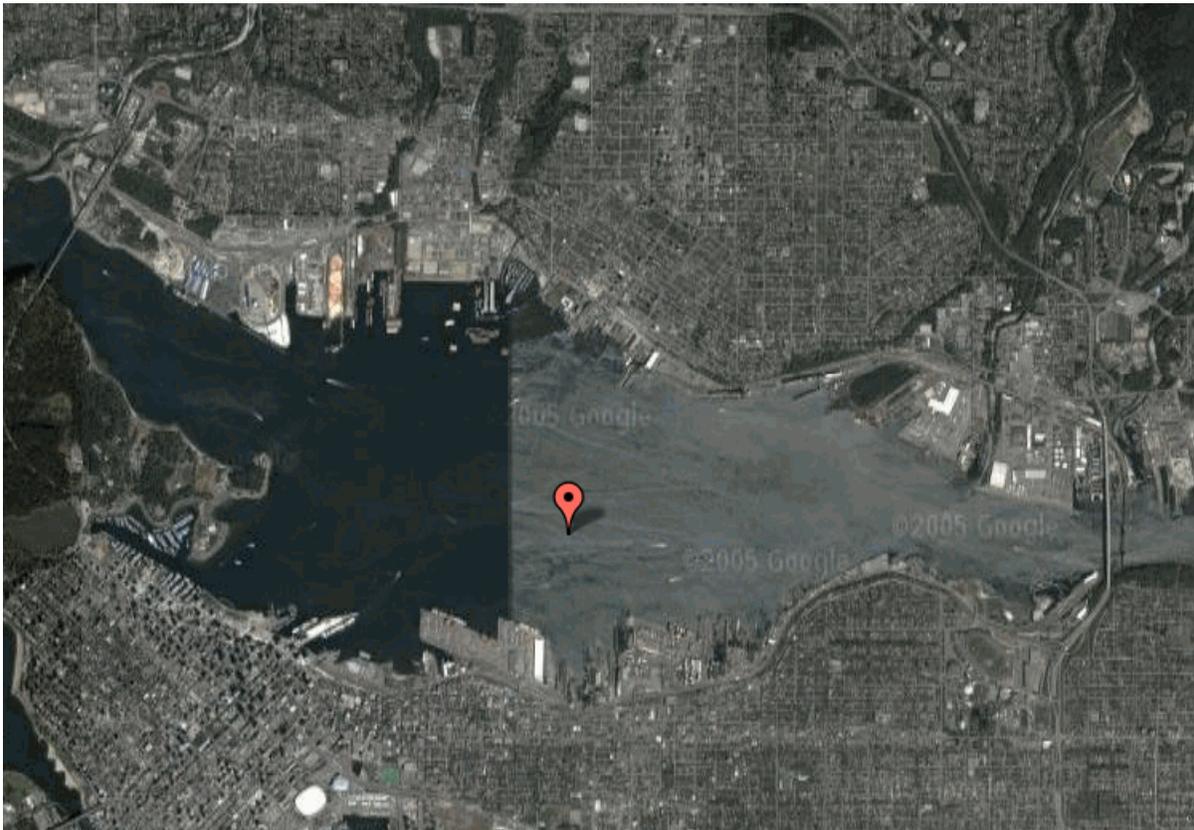
Account Profile & Owner information

Account Profile for Persuasion

Vessel Information
ID: Persuasion
Contact:
Email:
Phone1:
Phone2:
Phone3:
Lubber Line: 96
Magnetic Variation: 19

Account Information
Username:
Service:
Renewal:

Notification Threshold Settings

Level	Trigger a notification when no check-in occurred within this limit. (minutes)	Interval between subsequent notifications. (minutes)	Maximum number of notifications to send before giving up.	Email the notification to this email address.
Warn	60	5	1	
Panic	90	5	1	

Special Instructions

Password: _____ | Save changes |

❖ Owner/operator information is controlled on this page

❖ Notification timing intervals are user selectable as well as the number of message transmitted for a given notification

❖ Specific contact information for support or maintenance can be provided in the special instruction section

Yacht Owners Web Site

Alarm Notification Management Distribution

Email lists for Persuasion

Distribution List Management

In order to activate these lists, the notification email addresses in the profile section need to reflect the email addresses associated with these distribution lists. For example, the "Panic" notification email address should be set to "eob-persp@eyeonboard.com" (without the quotes).

Warning (eob-persw)
Check-in warning notifications can be sent to this group.

Panic (eob-persp)
Check-in panic notifications can be sent to this group.

Sensors (eob-perss)
Alerts from on-board sensors can be sent to this group.

Request current list	Request current list	Request current list
Add to list	Add to list	Add to list
Remove from list	Remove from list	Remove from list
Test the list	Test the list	Test the list

- ❖ The yacht owner or operator defines precisely which personal are notified based on the task responsibility
- ❖ The list can be modified and or verified as often as necessary
- ❖ The entire process has a single owner to ensure complete accountability
- ❖ There is no limit to the number of people on each list

Full Feature List

Full Feature List

❖ Security and Safety

Intrusion Sensors
Door(s) open/close
Motion
Glass breakage

Safety Sensors
Carbon monoxide
Smoke

Security System Controls
Keyed alarm system arm/disarm
Keyless alarm system arm/disarm
Alarm system arm/disarm via the Internet
Enunciator panel
External siren
Tamper monitoring

❖ Environmental Monitoring
AC shore power
Bilge flooding
Indoor temperature (Degrees F or Degrees C)
Outdoor temperature
Indoor humidity

❖ Camera System
Indoor wired tilt and pan camera
Outdoor wired tilt and pan camera
Indoor wireless tilt and pan camera
Outdoor wireless tilt and pan camera
Outdoor 360 degree tilt, pan, and zoom camera
All movable Cameras are controllable over the Internet
System supports 120 FPM video over the Internet
Preset positions for quick and repetitive viewing location

❖ Dockside Communication System

802.11B Wi-Fi compliant
Site survey to identify available wireless networks
400 mw signal strength yields over 1000′ line of sight range
54 GB private and secure on-board wireless network

❖ Underway or at Anchor Satellite Communication

INMARSAT – stationary satellite

KVH F55 and F77 systems supported
Full internet service and resources available
Position reporting with graphics
Automatic switch over of all EOB system service if Wi-Fi fails or is not present

Orbcomm – low orbit moving satellite

Skymate Communicator system supported
Near real time response (15 – 30 min data latency)
Text email and weather reports
Position reporting with graphics
Automatic switch over of all EOB system service (except video and remote control & command) if Wi-Fi fails or is not present

Cellular Data Service (where available & required internet cell phone)

Full internet service at reduced speeds including images
Real time positioning with graphics
Automatic switch over of all EOB system service if Wi-Fi fails or is not present

❖ System I/O Controller

Support for single or dual PC configurations
8 input contact scanner
4 NMEA input channels
Onboard remote power on/off
PC power cycling via the Internet (2 PC′s required)

❖ EOB Computer Systems

Industrial Grade Computer

50 degrees C operating temperature
Pentium class processor
80 GB storage
Small foot print 8″x10″x4
Windows XP professional
200 GB network storage for system wide auto backup

Standard Grade Computer

Shuttle architecture with heat pipe cooling technology
Pentium class processor
120 GB of storage
Windows XP professional
200 GB network storage for system wide auto backup

Highly Reliable Computer

Redundant Independent Array (Raid) Architecture
Dual 120 GB mirrored disk drive of storage
Pentium class processor
Windows XP professional
200 GB network storage for system wide auto backup

On-Board System Functions

On-Board System Functions

Launch Pad Window

The Launch Pad is accessed via the EyeOnBoard link on the desktop of your on board computer(s).

EyeOnBoard Web Site

Launches the EyeOnBoard web site. This requires the vessel to be connected to the internet.

Entry Alarm

The entry alarm window controls the following alarm system functions:

- ✔ Arm – arm the system and remain onboard
- ✔ Disarm – disarm the system while onboard
- ✔ Arm & Exit – arm the system after a 90 second departure delay
- ✔ Status – displays the current status of the alarm system in the message box at the bottom of the entry alarm window
- ✔ Clear – removes text from message box
- ✔ More – Alarm system status log

On-Board System Functions

Vessel Position Report Configuration
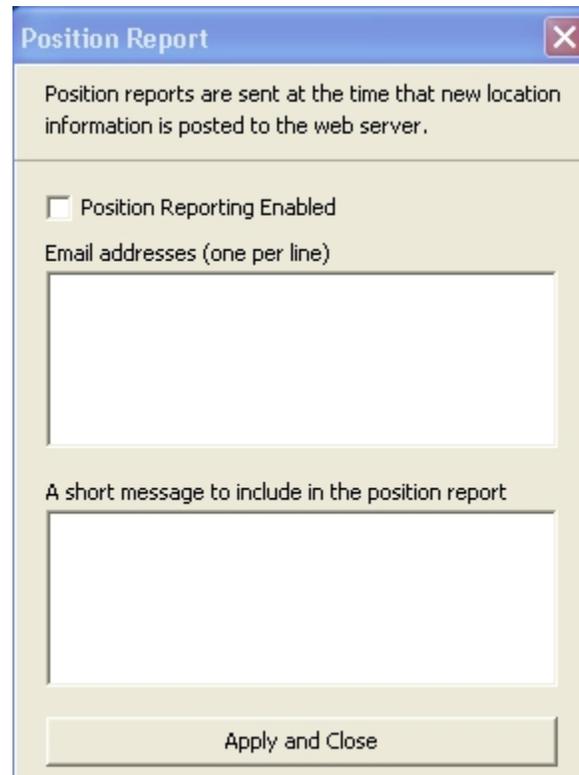
- ✓ Vessel position is always available on owners EyeOnBoard web site
- ✓ Used primarily when the vessel is underway
- ✓ Once enabled, an email position report is sent to the owner/operator defined distribution list.
- ✓ A personalized text message from the owner/operator can be attached to each position report.
- ✓ This service requires supported satellite equipment be installed on the vessel
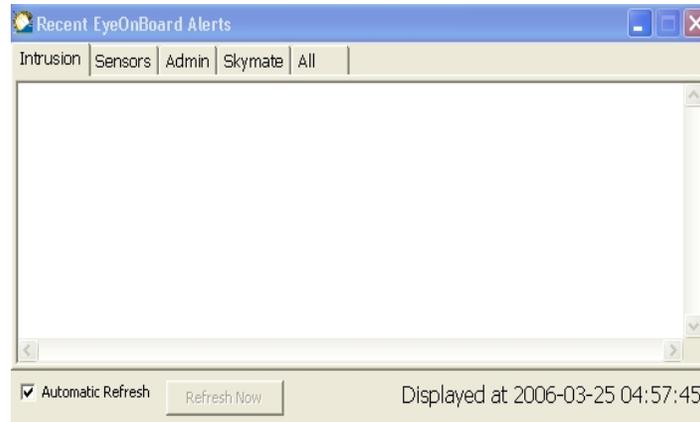
System Alerts

✓ The alert window displays internal system traffic from 4 key information sources
- The Intrusion tab is for security alerts
- The Sensor tab is for environmental sensors alerts
- The Admin tab is for administrative alerts and server communication traffic
- The Skymate tab is all traffic routed over the Skymate satellite connection
- The All tab combines all of the above tabs into the same window for viewing convenience

✓ Sample Admin and Skymate alert windows are shown below

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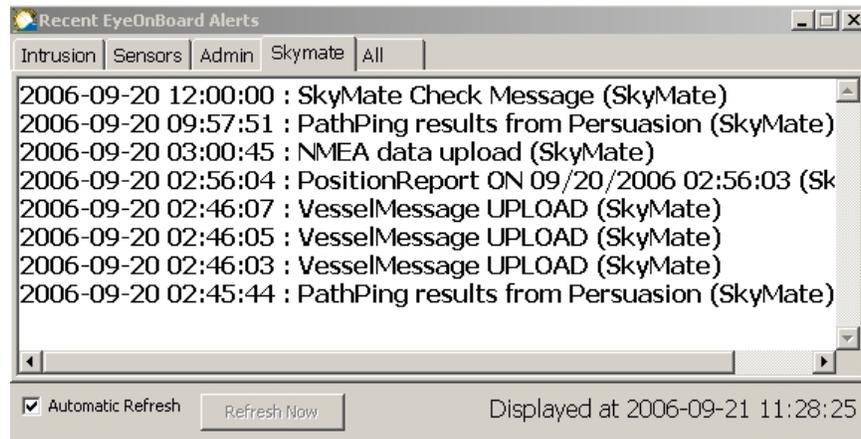
Onboard Network

This network menu allows the owner/operator to quickly select peripherals sub-systems and user defined web sites

- ✓ View and control onboard network tilt/pan/zoom cameras
- ✓ Manage environmental monitoring system (temperature, humidity, flooding, shore power)
- ✓ Manage Network router
- ✓ Manage WiFi radio

Connections Manager Window

The connection manager window provides a quick look at critical functions:

- ✓ Current status of the security system and the time/date when the status was updated
- ✓ Current status of the network connection and alternate connectivity options installed
- ✓ Current status of the number of NMEA devices that are reporting data. 100% means that all expected devices are reporting information. 75% would indicate that 3 out of the 4 device are transmitting information. Clicking on the box percentage will identify the devices reporting information
- ✓ More – Manual communication connection control

On-Board System Functions

Outbound Data Management Controls
(Data Transfer)
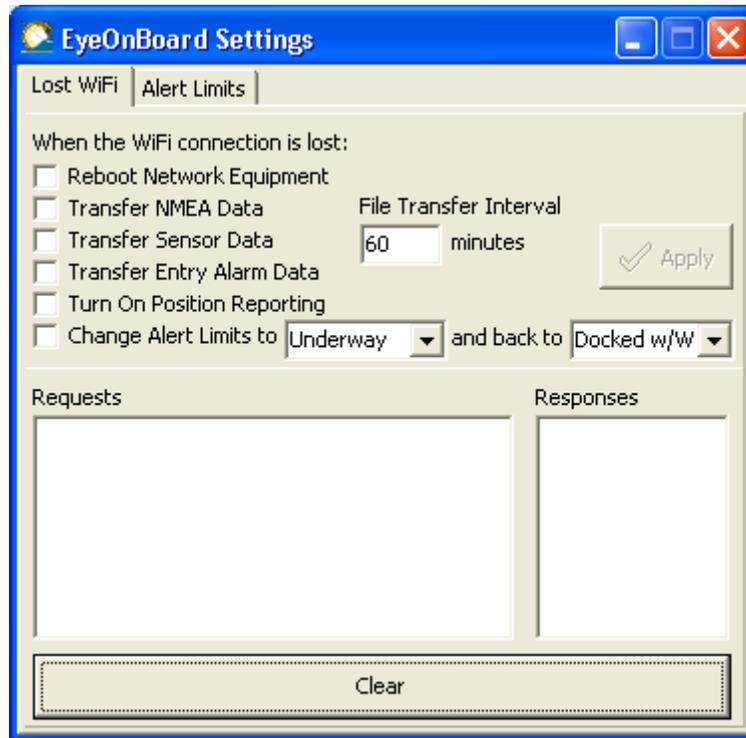
To manage satellite or cellular communication costs, the transfer of selected information along with a specific transmission interval can be owner/operator defined.

- ✓ This management service requires that supported satellite equipment be installed on the vessel
- ✓ Satellite transmission mode (or cellular mode if installed) is automatically activated when WiFi is lost
- ✓ Reboot Network Equip. – Power cycling the network equipment can re-establish WiFi connectivity after a brief network outage. Prevents unnecessary switching to satellite system
- ✓ NMEA data transfer – GPS, water depth & temp, wind speed & direction, air temp, house battery status sensor data

On-Board System Functions

- ✓ Sensor data transfer – environmental data (temperature, flooding, humidity, and shore power)
- ✓ Alarm system – Status of doors, hatches, smoke detectors, glass breakage detectors and CO detectors
- ✓ Position Reporting can be automatically turned on after switching to satellite service
- ✓ The active alert limit group can be automatically adjusted
- ✓ File transfer interval determines the number of minutes between selected information uploads.

Outbound Data Management Controls (Alert Limits)

- ✓ Prevents unnecessary alert reporting when operating over a satellite communication link
- ✓ Predefined sensor groups each with specific limits
Groups include No Alerts, All Alerts, Docked with WiFi present, Environmental (flooding, power loss, and temperature) and Intrusion (door sensors)

On-Board System Functions

System Support & Management Tools

- ✓ EyeOnBoard application services management tools
- ✓ Windows application services management tools
- ✓ I/O controller diagnostic tools
- ✓ Alarm system diagnostic tools
- ✓ Over the internet PC power cycling controls
- ✓ NMEA multiplexer management tools

Real Time Alerts

➢ A real time alert window appears when an alarm condition from the security system, the environmental monitoring system, or the connectivity monitoring system has been reported.

Sample real time alert windows

EyeOnBoard Alert

⚠ **Alert - Engine Room Bilge - WET**

EyeOnBoard Alert

⚠ **Restored - Engine Room Bilge - DRY**

EyeOnBoard Alert

⚠ **Salon Door just opened**

EyeOnBoard Alert

⚠ **Salon Door just closed**

After these window appear for a few seconds they will begin fading until they disappear

EyeOnBoard Services

Products and Services

❖ Information Access

Each yacht owner has password protected access to their specific yacht's information and controls

Information can be accessed from any Windows PC worldwide

❖ Yacht Information Reporting

Graphical yacht deck layout showing all monitored sensors and their current status

Satellite view of yacht location*

Water depth and temperature*

Wind speed and direction*

House batteries voltage, current, and charging status

*These functions require GPS, sounder, anemometer, and energy meter

❖ Alarm Notification Distribution

Email alarm messages to PC or mobile device

Alarm notification to as many people as required

❖ Still Camera Images

Images from each on-board camera updated very 10 minutes

Customer selected marina web cams

❖ Communication Link Performance

Wireless connectivity performance

Track which communication service is most frequently used

Select most cost effective service if choices are available

❖ Onboard Camera Control

View live images up to 120 frames per minute

Tilt, pan, zoom cameras controlled from owners web site

❖ System Configuration

Define camera privacy

Define information up-loads intervals

Define position reporting interval and distribution list

❖ EyeOnBoard *Eye-Watch Program*

Alert response and resolution management
Unauthorized yacht departure alert (requires onboard satellite communication system)
Owner/operator phone support
Computer maintenance
24/7 monitoring
Program includes:
- Network connectivity monitoring
- Worldwide remote command & control of onboard computer(s)
- Worldwide access to yacht information
- EyeOnBoard server account management
- Intrusion and safety monitoring and acquisition
- Environmental data monitoring and acquisition
- Marine instrumentation data acquisition
- Onboard camera control and image acquisition

❖ EyeOnBoard *You-Watch Program*

Owner has access to all system information and operating parameters
Owner defines system configuration
Owner responsible for alert response and resolution management
Program includes:
- Network connectivity monitoring
- Worldwide remote command & control of onboard computer(s)
- Worldwide access to yacht information
- EyeOnBoard server account management
- Intrusion and safety monitoring
- Environmental data acquisition
- Marine instrumentation data acquisition
- Onboard camera control and image acquisition