



ComNav<sup>®</sup>

MARINE ELECTRONICS





ComNav Marine, one of the largest privately held autopilot manufacturers in the world, has been providing advanced marine electronic solutions for the recreational, commercial and government markets for over 25 years. ComNav's proven products have earned a reputation for delivering exceptional performance and reliability in even the harshest sea conditions. Today, many of their products can be found in power and sail boats, racing sailboats, fishing vessels, work boats, mega yachts, coast guards, ferries, naval vessels, government fleets and large freighters.

With a commitment to innovation, ComNav's research and development team is constantly enhancing their products to meet the discerning needs in the marketplace for intelligent integrated navigation. Their extensive worldwide technical servicing dealer support and training programs in more than 150 countries ensures customer satisfaction. An extensive product line and intuitive operation offer safe and dependable navigation in extreme weather environments.

ComNav's premium marine electronics are engineered according to stringent IMO, Wheelmark and USCG certifications, while their quality management systems adhere to the International ISO 9001:2008 standards, and have proven time and time again to be robust and reliable. Each product undergoes intense and comprehensive testing, so you can be assured that when you're navigating with ComNav, you're in control with a clear direction.



# CONTENTS

MARINE NAVIGATION SOLUTIONS .....	1
P SERIES - AUTOPILOT .....	3
1420	
1440	
1460	
1500	
COMMANDER P2VS	
COMMANDER P2	
ADMIRAL P3	
1001	
2001	
ACCESSORIES: REMOTE CONTROLS	
NX3 SERIES - INSTRUMENTS .....	9
NX3 SAIL	
NX3 POWER	
NX3 TRANSDUCERS	
G SERIES - GPS COMPASS .....	15
G1	
G2	
G2B	
G2 DISPLAY	
G3 DISPLAY	
X SERIES - AIS .....	19
MARINER X2	
MARINER X2 12W	
VOYAGER X3	
V SERIES - THERMAL CAMERA .....	23
V1C	
V1T	
V1T HR	
V2	
V5	
HV SERIES - HANDHELD CAMERA .....	29
HV 100	
HV 125	
HV 150	
HV 260	
HV 280	
C SERIES - MARINE MONITORS + TABLETS .....	33
C12, C15, C19, C23	
CS12, CS15, CS19	
CT10, CT12	
SPECIFICATION .....	37
WORLDWIDE SERVICE AND WARRANTY .....	59
QUALITY ASSURANCE AND SUSTAINABILITY .....	60



# MARINE NAVIGATION SOLUTIONS

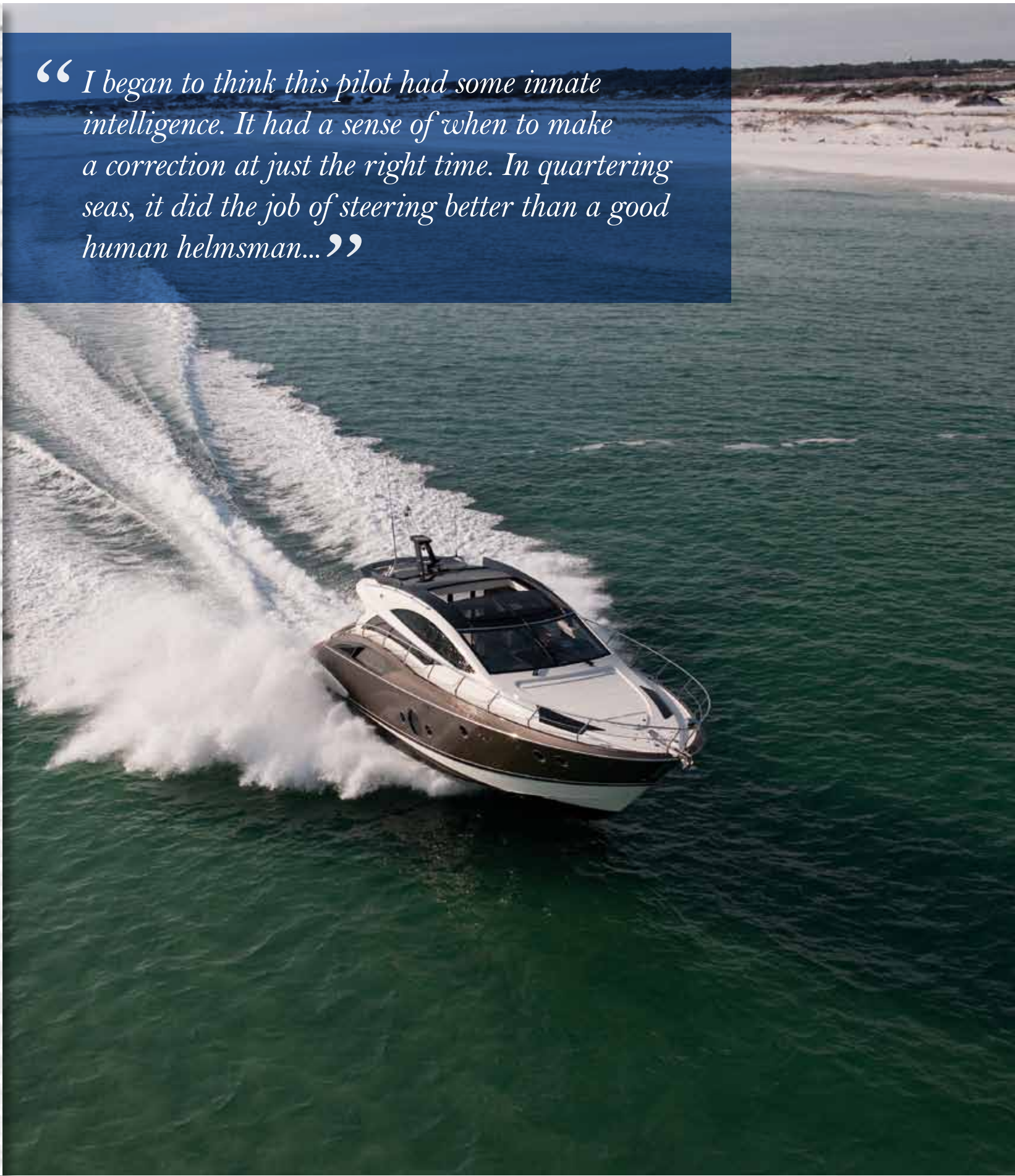


The world of onboard navigation systems has evolved and ComNav is leading the way. With a dedication to providing seamless integration, all products encompass NMEA 2000 and/or NMEA 0183 interfaces. The users have the flexibility to add as few or as many components as desired to create the perfect navigation solution for your vessel. Combining style and performance,

the electronic multifunction displays offer the rugged dependability that will handle any marine environment with inspired elegance to complement any boat decor. Innovative technology designed for the sophisticated mariner provides a redefined marine navigation suite for unsurpassed performance.



*“I began to think this pilot had some innate intelligence. It had a sense of when to make a correction at just the right time. In quartering seas, it did the job of steering better than a good human helmsman...”*



# P SERIES

## Autopilot

For over two decades, ComNav's Autopilot Systems have gained a reputation for excellent steering performance in the harshest of sea conditions. Fully compatible to onboard instruments, they are available in various sizes and configurations to accommodate any vessel type and steering system. Featuring automatic trim and easy “on the fly” course adjustment options, ComNav's P Series offer precise steering capabilities for smooth navigation. Plus, they're easy to install via automatic parameter set ups including compass calibration and drive detection. For enhanced safety, ComNav Autopilots are manufactured using state-of-the-art technology offering systems which meet CE requirements, IMO compliance, Wheelmark registrations and waterproof integrity to IP67 standards. In addition, each product comes with an extended 3-year warranty. With built in self-testing diagnostics, visual indicators and audible alarms, ComNav's P Series offer a safe and reliable navigating experience.

### Intelligent Steering Technology (IST)

ComNav's P Series feature auto-learning technology – an innovative and adaptive software system that dynamically optimizes essential parameters for clear navigation through various external factors (i.e. speed, trim, drift, currents, tide, weather and wind effects). IST often results in seamless smooth navigation while also providing fuel consumption savings.



GO TO PAGE 39 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





## AUTO STEERING TECHNOLOGY FOR SMALL TO MID-SIZE VESSELS

- > Clip mounted for fixed and handheld operation
- > Simple keypad touch heading control, from one degree to major course changes
- > Easy yaw, sea state and automatic trim settings
- > One-push button: Up to 14 selectable steering parameters for fast and slow modes
- > Backlit LCD display with adjustable brightness for night viewing
- > Up to four stations optional analog rudder angle indicators
- > NMEA 0183 communication: accepts GPS navigation and outputs heading

### HOW TO CHOOSE THE RIGHT AUTOPILOT

ComNav P Series universally accommodate hydraulic, mechanical and power assisted stern drive systems, so in order to select the best autopilot for a vessel, it's imperative to properly understand a boat's steering system. Depending on the vessel's application, autopilots are available in various drive configurations, and can be outfitted with several remote accessories such as Full Follow Up (FFU), Joystick (NFU) and extra control stations.



**COMING SOON – PRODUCT INNOVATION**

**P1**

- > Fixed or handheld operation
- > Intelligent, predictive automatic pilot
- > Built-in accelerometer: screen flips according to horizontal and vertical mounts
- > NMEA 2000 compliant

## OPTIMIZED FOR SAIL AND POWER

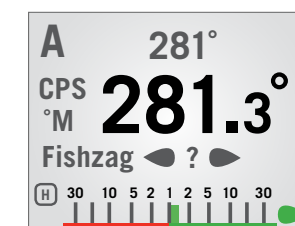
- > Crystal clear high contrast sunlight viewable color or monochrome LCD
- > Multi-level backlit LCD and illuminated keypad night viewing
- > Adjustable yaw, sea state, counter rudder and turn rate settings for all weather conditions
- > Advanced power features include 'No Course Drift' with Automatic Leeway Control (ALC)
- > Proportional rate control for gentle response at fast cruising speeds
- > GPS Nav mode provides precise adaptive track steering
- > Optimal wind display for performance sail tacking and gybing
- > Multi-language capability

### A BASIC ELECTRONICS PACKAGE INCLUDES:

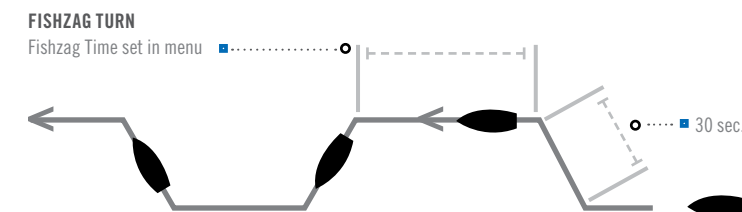
Control head, processor, compass, reversing pump set drive or solenoid output and rotary or linear rudder feedback. The mechanical sail pilot will encompass the integrated linear drive for quadrant attachment. The virtual feedback autopilots eliminate the requirements of a rudder feedback installation for outboard drives.



### QUICK TURN SELECTIONS FOR HIGH EFFICIENCY



Fish zag turn allows for mimicking the actions of live prey more closely for efficient hunting. Additional turn options include continuous circle, u-turn and emergency MOB Williamson Recovery.



GO TO PAGE 39 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





## ENGINEERED FOR MEDIUM TO HIGH END VESSELS

- > Proven rugged design for mid to large size vessels up to 1000 ft.
- > IMO compliant, USCG approved, Wheelmark certified
- > Crystal clear high contrast sunlight viewable colour or monochrome LCD
- > Multiple backlight levels for LCD and illuminated keypad for night viewing
- > Proportional rate control for gentle response at fast cruising speeds

### EMBEDDED WORK MODE

The auto work mode is embedded in all professional autopilots and is specially designed for commercial boats to assist with trawling, towing, being towed, trolling on one engine, slow speed, dredging, etc.

- > Adjustable yaw, sea state, counter rudder and turn rate settings
- > Advanced power features including Automatic Helm Bias and Automatic Leeway Control (ALC)
- > PORT and STBD dodge keypads for collision avoidance
- > Automatic thruster assist for dead-ahead slow or station keeping
- > Quick turn selections for continuous circle, u-turn and emergency MOB Williamson Recovery
- > Pre-set parameter programs onboard for full or semi-displacement, planning hulls, etc.
- > Multiple steering parameters for fast, slow and work modes
- > GPS Nav mode provides precise adaptive track steering
- > Up to 4 analog rudder angle indicator stations

## STAY RIGHT ON COURSE WHEN THE GOING GETS TOUGH

FOR HIGH SEAS COMMERCIAL AND PROFESSIONALS



### ENHANCE YOUR HEADING ACCURACY

Does your autopilot have the edge for demanding sea conditions? The precision auto-steering capability can be further upgraded to a solid state rate stabilized compass or satellite type GPS gyro based compass, all NMEA interfaced.



### STABLE COURSE HOLDING RESULTING IN FUEL SAVINGS

ComNav Autopilots offer precise and steady vessel steering with easy settings for seamless performance at various speeds. Professional performance is further achieved by independent rudder response setting capability for fast and slow vessel speeds. Optimal parameter set-ups combined with adjustable sensitivity levels allow for smooth course and direct GPS track holding to your next waypoint. Overall, elimination of unnecessary corrections and overshooting of course errors results in gentle and comfortable auto-steering.

### COMING SOON PRODUCT INNOVATION

P5



- > Large format control head suitable for mega yachts, workboats and commercial vessels
- > Intelligent algorithms for professional performance
- > Wheelmark certified, IMO compliant, USCG approved
- > Large size keypad and rotary knob
- > NMEA 2000 compliant



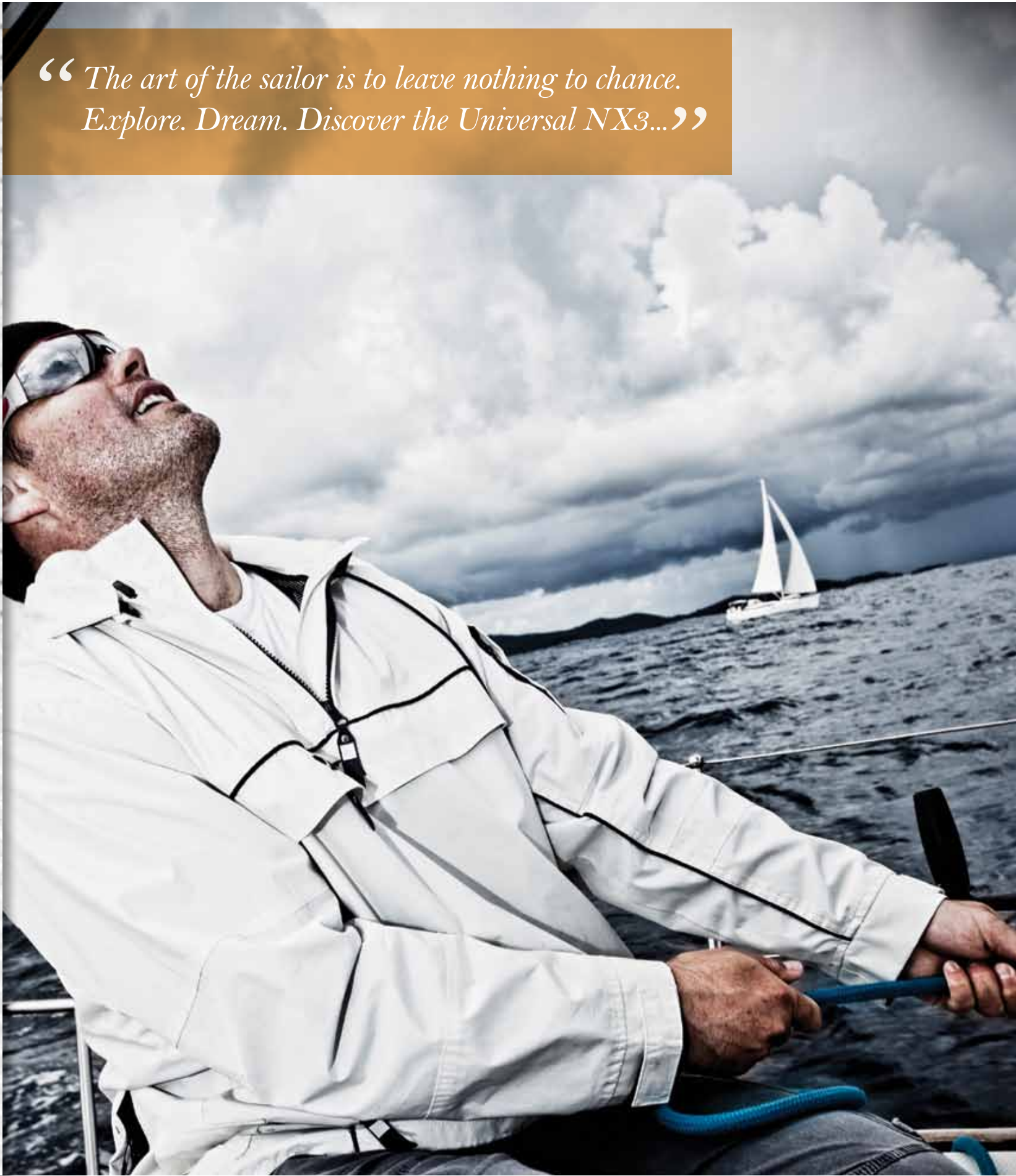
### EXTRA FLEXIBILITY AND COMFORT

For increased maneuvering and operational options, ComNav offers a broad range of remote full follow up (FFU), joystick (NFU) and extra station controls and instrumentation compatible with our advanced autopilots. These accessories give the vessel operator the freedom to control the tiller power steering and autopilot course functions from the bridge or any other location onboard.



GO TO PAGE 39 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





“The art of the sailor is to leave nothing to chance.  
Explore. Dream. Discover the Universal NX3...”

# NX3 SERIES

## Instruments

Utilizing the most recent advances in multi-function display capability, combined with intuitive graphical menus, the ComNav NX3 Instruments offer boaters the utmost in precision performance. The ComNav NX3 Series is designed for sail, power and commercial boaters alike. The easy to install universal instruments provide user-friendly, intuitive, high-contrast graphic displays for quick access to sophisticated navigation data. Plus, the NX3 Series is fully NMEA 2000 compliant and loaded with NMEA 0183 interfaces for simple connection to autopilots, radar, chart plotter and PC displays for a truly integrated instrumentation experience.



GO TO PAGE 43 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





VAST ARRAY OF INFORMATION FOR THE COMPETITIVE RACER

This package offers the most comprehensive electronic instruments on the market today. With customized displays to determine tacking, gybing angles and laying lines to the mark, it interfaces with any computer to calibrate speed on both starboard and port tacks heading windward or downwind.

SAIL PACKAGE

The introductory NX3 Sail Package offers skippers speed, depth, and wind with the additional flexibility to add larger NX3 30 mast mounted instruments, as well as additional sensors.



THE INSTRUMENT OF CHOICE FOR SAILORS

MULTI-FUNCTIONAL,  
UNIVERSALLY CONFIGURABLE

- > Large high resolution 4.3" LCD cockpit display, and large format wide viewing 7" LCD mast display
- > Digital and analog vibrant sunlight viewable colour display
- > Split screen, graphical trends, close hauled indicator, bar chart menus
- > Built-in remote control feature
- > Extremely accurate readings in even the slightest breeze

DEPTH FUNCTIONS

Water Depth  
Shallow Alarm  
Depth Alarm  
Battery Voltage  
Anchor Alarm  
Water Temperature

SPEED FUNCTIONS

Boat Speed  
Average Speed  
Target Boat Speed  
Countdown Timer  
Elapsed Timer  
Trip Distance #1  
Trip Distance #2  
Total Distance  
Polar Table

COMPASS FUNCTIONS

Compass Heading  
Course Made Good  
Distance Made Good  
Current Set  
Current Drift  
Headers and Lifters  
Target Course  
Heel Angle

WIND FUNCTIONS

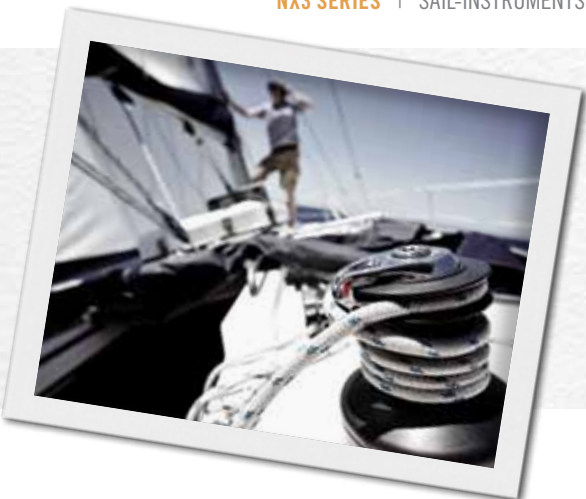
Apparent Wind Speed  
Apparent Wind Angle  
True Wind Speed  
True Wind Angle  
Velocity Made Good  
Geographic/Mag Wind  
Target Wind Angle

NAVIGATION NMEA FUNCTIONS

Speed Over Ground (SOG)/  
Course Over Ground (COG)  
Bearing To Waypoint (BTW)/  
Distance To Waypoint (DTW)  
Cross Track Error (XTE)  
UTC  
TTG to Waypoint  
Waypoint Closure  
Velocity  
Present Position  
Man Overboard

SYSTEM ALARMS

Shallow Alarm  
Depth Alarm  
Off-Course Alarm  
Arrival Alarm  
Racer Alarm  
5 and 10 Minute Alarm  
8 Timer Safety Alarms



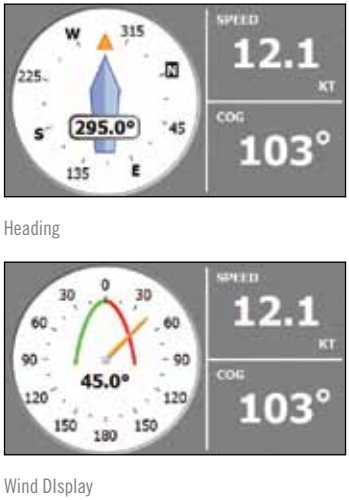
BUILD YOUR OWN PACKAGE  
CUSTOMIZE YOUR  
UNIVERSAL INSTRUMENT!

RACING PACKAGE

Designed specifically for the long distance ocean racer, this package provides all benefits of the NX3 Sail Package but with two additional features. Mounted on to one mast bracket, the enlarged NX3 30 instrument enables all information to be displayed from the mast for the entire crew to view. With the additional Solid State Rate Compass streaming real time data to the helmsman and tactician, adjustments in crew placement are instantaneous, and crucial target boat speeds are maintained. An additional Vector G1 Satellite Compass is available as an option for Offshore Racers that is both WAAS and EGNOS compatible.



CUSTOM DESIGN DISPLAYS



AUTOMATIC BACKLIGHT NIGHT TIME ADJUSTMENT



GO TO PAGE 43 FOR FULL PRODUCT  
SPECIFICATIONS AND COMPARISONS





# PRECISION INSTRUMENTS FOR SAFE AND COMFORTABLE BOATING

## THE KEY PART OF ANY ELECTRONIC NAVIGATION SYSTEM

Built to withstand even the toughest marine environments, ComNav's NX3 Series provides continuous information on a variety of sea data like speed or depth, with a multifunction instrument. At its core, NX3 gathers and processes all information collected from the transducers and then transmits it back through a single cable via the NMEA 2000 network.

## POWER PACKAGE

The standalone Power Starter Package includes a NX3 colour display instrument, as well as a triducer for speed, depth and water temperature. Also included is the Solid State Rate Compass, and an optional G1 Satellite Compass and weather station can be added as your need for further information increases. The weather station provides a wide array of crucial information to the mariner, which includes wind speeds, true and apparent, air temperature, wind chill, WASS / EGNOS GPS and numerous other features.



# BUILD YOUR OWN PACK

CHOOSE FROM A VARIETY OF TRANSDUCERS  
THAT SUIT YOUR NEEDS!

### DEPTH FUNCTIONS

Water Depth  
Shallow Alarm  
Depth Alarm  
Battery Voltage  
Anchor Alarm  
Water Temperature

### SPEED FUNCTIONS

Boat Speed  
Average Speed  
Target Boat Speed  
Countdown Timer  
Elapsed Timer  
Trip Distance #1  
Trip Distance #2  
Total Distance

### COMPASS FUNCTIONS

Compass Heading  
Course Made Good  
Distance Made Good  
Current Set  
Current Drift  
Target Course

### WIND FUNCTIONS

Apparent Wind Speed  
Apparent Wind Angle  
True Wind Speed  
True Wind Angle  
Velocity Made Good  
Geographic/Mag Wind  
Target Wind Angle

### NAVIGATION NMEA FUNCTIONS

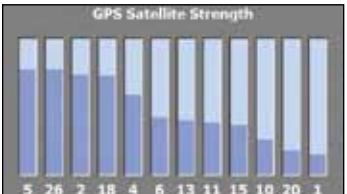
Speed Over Ground (SOG)/Course Over Ground (COG)  
Bearing To Waypoint (BTW)/Distance to Waypoint (DTW)  
Cross Track Error (XTE)  
UTC  
TTG to Waypoint  
Waypoint Closure Velocity  
Present Position  
Man Overboard

### SYSTEM ALARMS

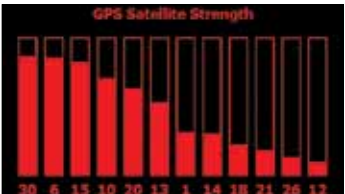
Shallow Alarm  
Depth Alarm  
Off-Course Alarm  
Arrival Alarm  
Racer Alarm  
5 & 10 Minute Alarm  
8 Timer Safety Alarms



## CUSTOM DESIGN DISPLAYS FOR DAY AND NIGHT VIEWING



GPS Bar Graph



GPS Bar Graph Night



GPS Satellites



GPS Satellites Night



Heading Large



Heading Large Night



Speed Trip



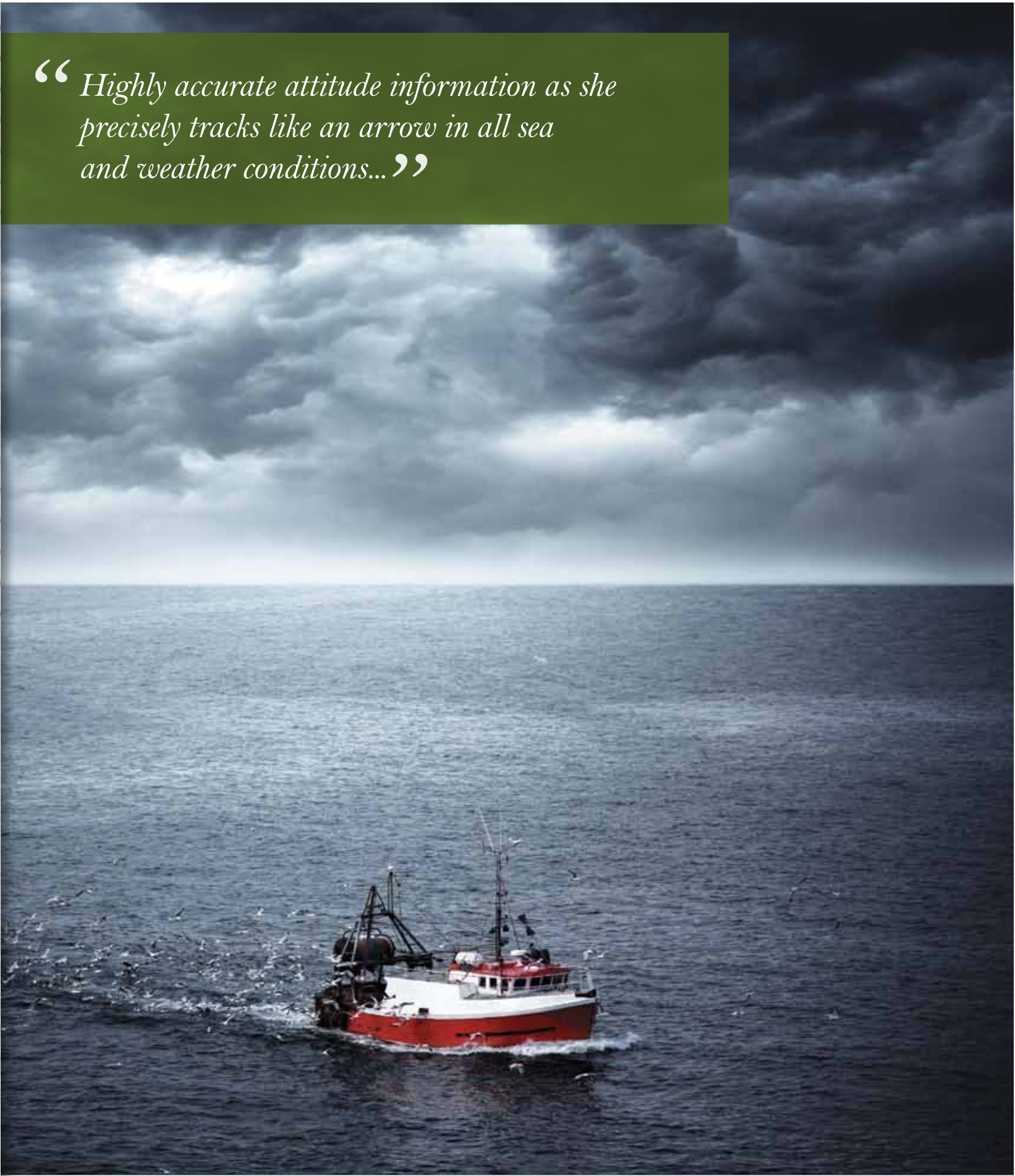
Speed Trip Night



GO TO PAGE 43 FOR FULL PRODUCT  
SPECIFICATIONS AND COMPARISONS



“Highly accurate attitude information as she precisely tracks like an arrow in all sea and weather conditions...”



# G SERIES

## GPS Compass

ComNav's Satellite Compass uses advanced GPS kinematic technology to update precise heading, position, rate of turn, speed, heave, pitch and roll information. With the single data cable plug-n-play installation, this low maintenance compass is made without moving parts and therefore does not require routine upkeep. Unlike magnetic or gyro compasses, accuracy is not affected by g-force or velocity. Integrated gyro and tilt sensors offer unmatched accuracy, providing heading during momentary loss of satellite signals so seamless navigation is experienced during quick GPS signal reacquisition.

### Pinpoint Heading and Positioning Accuracy

The compass works by detecting GPS satellites in the visible sky and then uses this signal to compute positions within 2.5 meters (8.2 feet) and headings within 0.5 degrees. To account for the standard error in all GPS data calculations, the compass also tracks a differential correction that improves position accuracy to better than 1.0 metre (3.3 feet).



GO TO PAGE 47 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





- > Accurate, reliable, high-precision position and rate of turn
- > Better than 0.5 degree (G1) and 0.6 degree (G2, G2B) heading accuracy
- > 90 degree per second Rate of Turn (ROT) tracking
- > Fast start up signal reacquisition time
- > Integrated gyro and axis sensors provide heading during momentary signal loss
- > With 20 Hz position and heading update rates (10 Hz standard)
- > DGPS provides sub meter accuracy
- > Differential correction source options include SBAS (WAAS, EGNOS, MSAS) and RTCM SC-104 data
- > Multiple baud rate selections
- > NMEA 0183 and NMEA 2000 compliant
- > Waterproof to IP67 standards
- > G2B with integrated beacon receiver module for terrestrial DGPS signals to enhance positional accuracy
- > High contrast colour LCD with night vision mode
- > Multiple backlight levels for LCD and keypads
- > Receiver supporting GPS and GLONASS satellite tracking

## WORLD'S SMALLEST GPS COMPASS

### AUTOMATIC SBAS TRACKING

The GPS Compass automatically scans and tracks satellite-based augmentation system (SBAS) signals without the need to tune the receiver. Its dual 12-channel parallel tracking provides an enhanced ability to maintain a lock on an SBAS satellite when more than one satellite is in view. This redundant tracking design approach results in more consistent data in areas where signal blockage is possible.



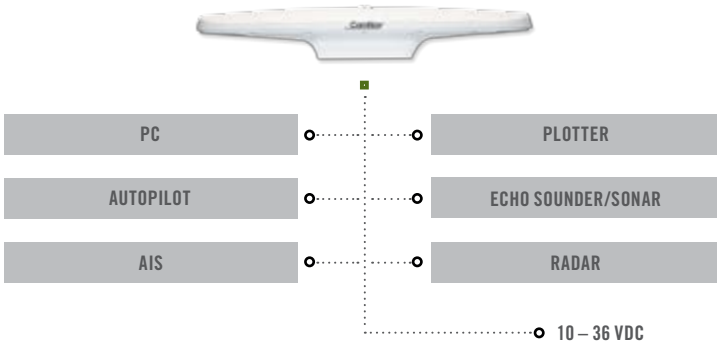
## IMO COMPLIANT, WHEELMARK CERTIFIED

### SYSTEM CONFIGURATION

For enhanced performance on integrated navigation, ComNav GPS Compass is fully compatible with all industry standard marine equipment networks. Less than a plug away, it can be interfaced with a chart plotter, sonar, radar, AIS, autopilot and computer systems.

### EMBEDDED TECHNOLOGY

ComNav's GPS Compasses utilizes special software for reduced outages, blockages or interferences. It allows the ability to use previous correction data for up to 40 minutes without affecting the positioning performance. Reliable technology for peace of mind with – easy and safe navigating with less travel time!

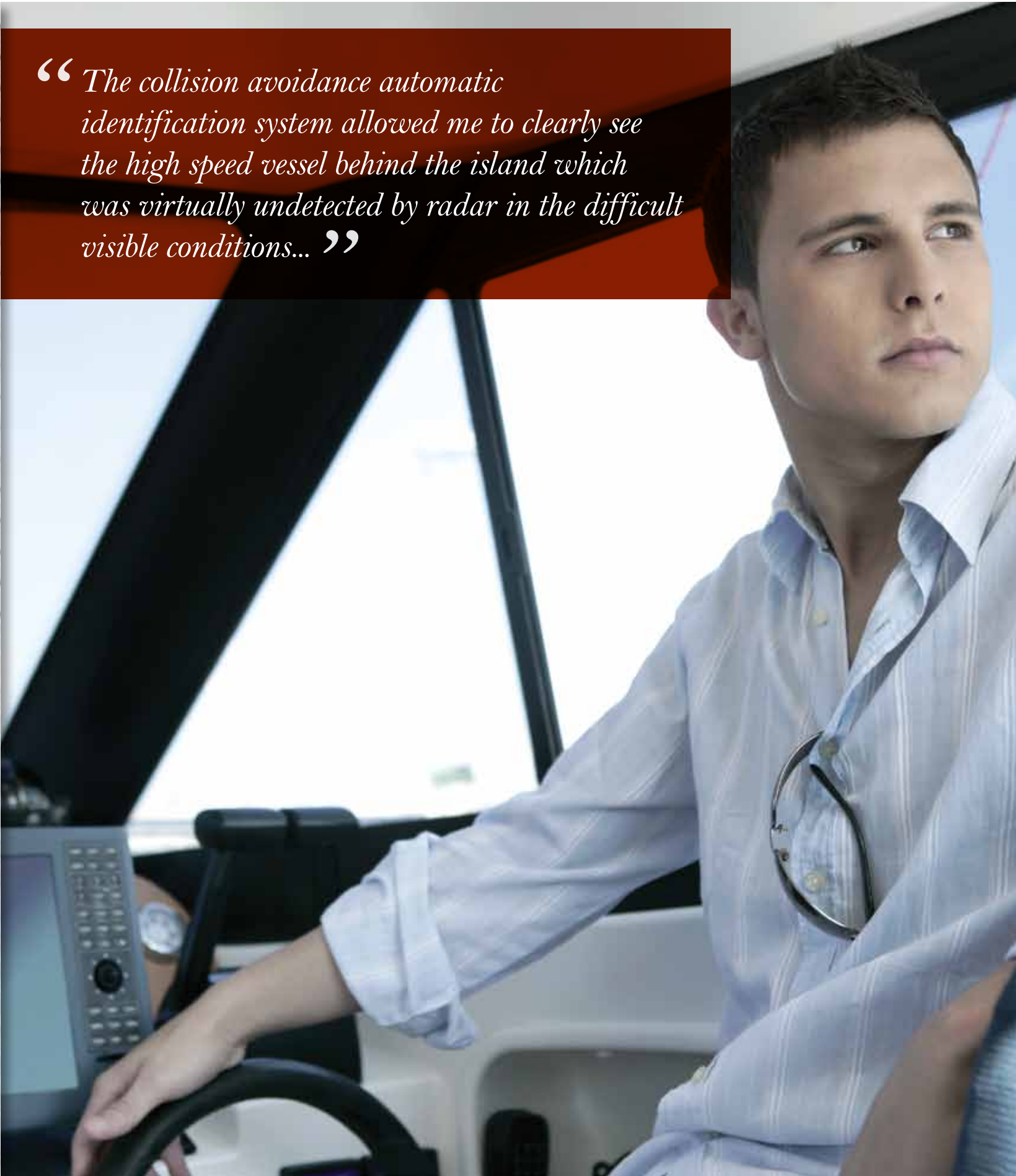


### FULLY IMO COMPLIANT



GO TO PAGE 47 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





“The collision avoidance automatic identification system allowed me to clearly see the high speed vessel behind the island which was virtually undetected by radar in the difficult visible conditions...”

# X SERIES

## AIS

As a pioneer in Automatic Identification Systems (AIS), ComNav combines innovative technology with the highest quality engineering to deliver world-class products that meet the needs of all marine applications. Each product is equipped with a state-of-the-art AIS engine for guaranteed operational performance and mission critical reliability. Shock and vibrant resistant, ComNav offers a diverse selection of AIS applications to satisfy the requirements of all vessel types operating in each jurisdiction, whether it is ocean voyages in open waters or closed tight inland waterways. AIS waterproof electronics designed to IP67 standards, meet international compliance requirements including USCG, IMO, Wheelmark, FCC, IEC and Type EU and undergo rigorous testing to ensure the highest quality and performance standard for enhanced safety.

### Class A and B Transceivers

Class A transceivers are similar to the Class B variety, but are designed to fit commercial and professional vessels such as fishing vessels, workboats, passenger vessels and cargo ships. With a higher frequency and more powerful Very High Frequency (VHF) signal, Class A transceivers boast the capability to be detected by vessels from a long distance while transmitting and receiving identification and navigation data. Class A transceivers are mandatory on all vessels over 300 tonnes, on international voyages and certain types of passenger vessels that fall under the SOLAS mandate. In addition, specific inland waterways and geographic sectors are regulated with specialized Class A units for safe and secure navigation.



GO TO PAGE 51 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





# ENHANCED SAFETY AND SECURITY AT SEA

## SECURITY AND PORT VESSEL TRAFFIC MANAGEMENT

Through transmitting precise navigation data, AIS helps to identify and track vessels for traffic management, improves border security, and reduces coast guard response time.



COMING SOON – PRODUCT INNOVATION

**MOB X100**

- > Revolutionary compact life saving aid
- > Significantly reduces search and rescue response times
- > Professional level performance in a comfortable unit
- > For skippers, crews, families and pets

**ID X120**

- > Identifier with multiple security features
- > Fully integrated AIS beacon device
- > Battery powered only or as a combo with external power
- > Simple to install for quick and easy use

**SART X150**

- > Safe, secure and reliable search and rescue transmitter
- > Best in class transmission range
- > Unique patent pending antenna technology
- > Highly durable and innovative design

**VOYAGER X5 CLASS A**

- > Highly configurable multi-channel AIS
- > Embedded chart plotter with internal GPS antenna
- > Dual NMEA 2000 and 0183 compatibility
- > R-max technology for real-time data

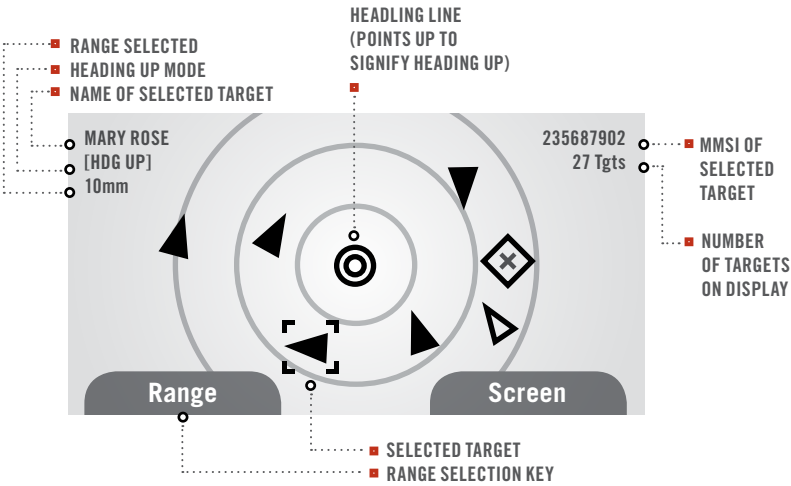


GO TO PAGE 51 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS

# SEE AND BE SEEN



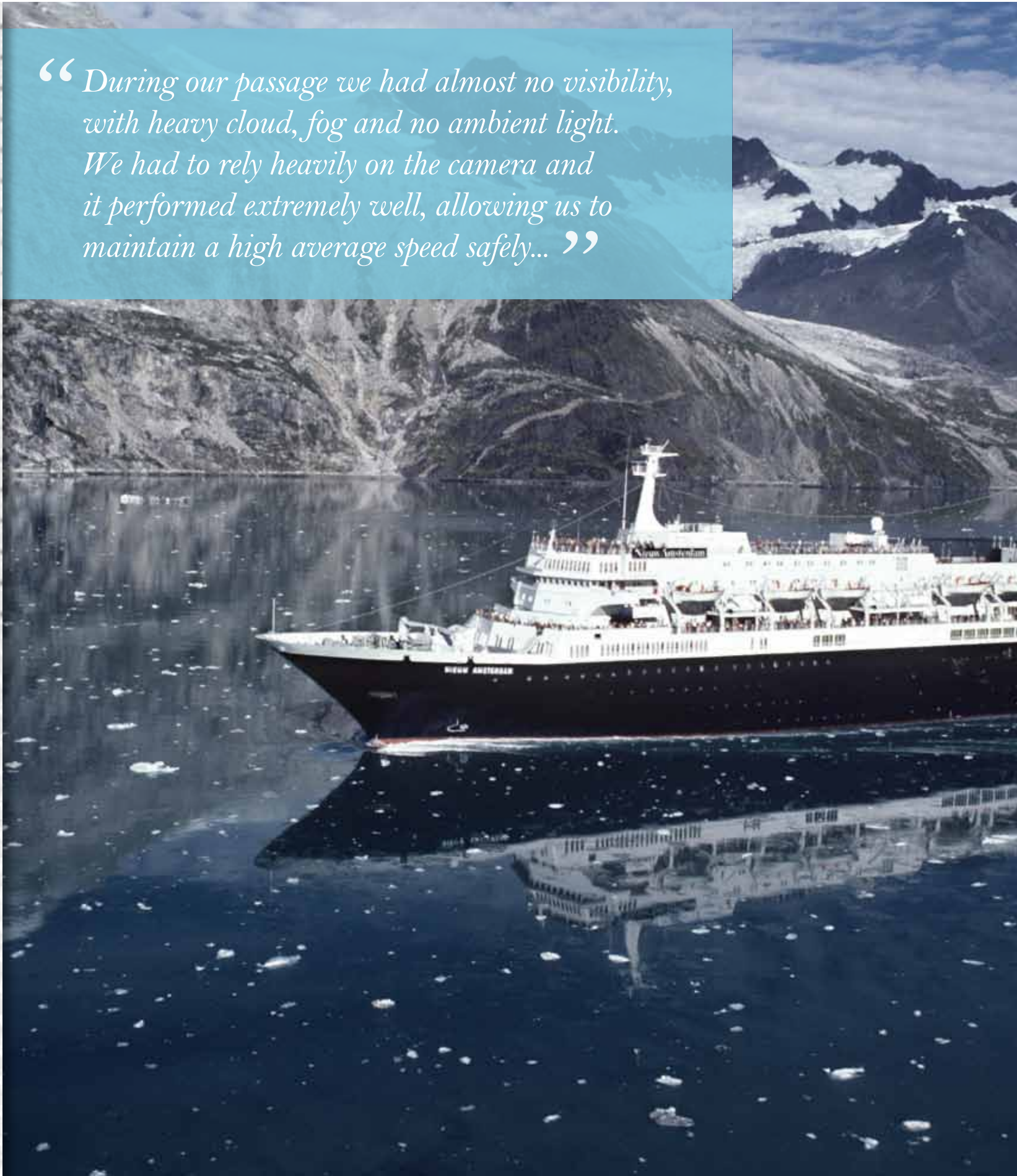
- > Compact single plug-n-play unit
- > Selectable operating screen displays
- > Safety advantage especially in low-visibility conditions
- > Auto configuration for safety related messages (SRM) that reduce search and rescue times
- > Silent mode option to enhance security and to avoid detection by pirating vessels
- > Pro AIS software for message broadcast including Maritime Mobile Service Identifier (MMSI)
- > Class B Mariner X2 now available as 12 W power boosted version
- > Shock and vibration resistant, IP67 waterproof design
- > NMEA 2000 and NMEA 0183 compatibility



## MONITOR AND TRACK YOUR FRIENDS OFF SHORE

The AIS is a marine location and vessel information reporting system between vessels and shore traffic monitoring centers. Featuring automatic and dynamic wireless sharing capabilities, the system allows vessels equipped with AIS to easily share with each other information on their position, speed, course and vessel identity, and provide regular updates as needed. Boat position originates from the Global Positioning System (GPS), while communication between vessels is through VHF digital transmissions.





*“During our passage we had almost no visibility, with heavy cloud, fog and no ambient light. We had to rely heavily on the camera and it performed extremely well, allowing us to maintain a high average speed safely...”*

# V SERIES

## Thermal Camera

ComNav’s V Series is specifically designed for practical and extreme marine navigation and security applications, offering users the confidence to navigate safely in complete darkness. With a remarkably sleek, compact design and flexible mounting, the V Series satisfies boaters’ needs for a fully functioning, high quality image camera that integrates seamlessly with other systems. For enhanced durability, the V Series is designed to exceed certain Mil specification standards and are also water, wind, vibration and shock resistant. Featuring various scene and user selectable situational modes, this high-resolution camera boasts a picture that’s significantly clearer than its rivals. Boaters will also enjoy one-touch vision access and pan-tilt zoom control for easy and smooth positioning of the camera towards radar and AIS targets.

**Digital Pattern Enhancement (DPE)**  
With ComNav’s Digital Pattern Enhancement (DPE) boaters get sharper pictures with higher resolution, even capturing faint image details in complete darkness, light fog, smog or low light environments. An interpolation algorithm for temperature gradients results in quicker and clearer situational awareness.



GO TO PAGE 52 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





## NAVIGATE WITH CONFIDENCE IN EXTREME LOW LIGHT

- > High resolution compact design
- > Multi-protocol telemetry control compatible with multi-function displays (MFD)
- > Continuous 360° pan and +/- 90° tilt with auto flip provides commanding aid in twilight hours and allows for optimal maneuvering for docking inside marina
- > Colour and monochrome view selectable for increased image sensitivity
- > 26x optical zoom, 12x digital zoom
- > Flexible mounting, high precision positioning
- > Various scans, auto focus and picture options
- > Additional features with PC interfacing
- > Auto, Auto Trace (ATW), indoor, outdoor, one click manual
- > Picture effects: E-Flip, Nega Art, Black and White, Mirror Image

### STEER CLEAR OF MARINE LIFE AND GLARING OBJECTS

With crystal clear imaging, whales and sea lions swimming along the surface can be detected with ample time to alter your course.

### NAVIGATION AT TWILIGHT – MORE TIME ON THE WATER

Low light vision offers safe and confident navigating with a precise ability to spot obstructions such as buoys, floating debris and other vessels, even in twilight and sunset. So boaters have the freedom to extend their day on the water well into the evening.



#### SITUATIONAL AWARENESS

Anti-piracy security tool; allows for comprehensive multi-zone monitoring, long range viewing and greater night vision, iceberg detection, fire detection.



#### MAN OVERBOARD RESCUE

Can assist with faster response times in man overboard search and rescue applications.

## DIGITALLY RATE STABILIZED FOR VIEW IN TOTAL DARKNESS



### THERMAL VISION TECHNOLOGY

Unlike conventional cameras that rely on amplified ambient light to identify objects, thermal imaging cameras detect objects by the heat they emit or from temperature differences. The engine inside the camera is so sensitive that it can detect variances in temperature, and can even sense the thermal energy in the long wave infrared spectrum of ice. Because thermal imaging cameras process radiated energy, rather than reflected, no source of illumination is required.

- > V1T with 384x288 pixels provides 44% greater image quality than conventional units
- > V1T HR with 640x288 resolution and up to 12x zoom
- > Easy touch 2x, 4x electronic zoom via joystick control keypad
- > Continuous 360° pan and +/- 90° tilt with auto flip provides commanding aid in twilight hours and allows for optimal maneuvering for docking inside marina
- > High precision positioning
- > Additional features with PC interfacing
- > 5 Display Modes: Black Hot, White Hot, Red Black, (Reverse) Iron Bow
- > Scene Selection Modes: Day/Night Running, Man Overboard, Fog, Marina



#### SECURITY

Helps to identify and track vessels or objects on perimeter security, collision avoidance, vessel and crew protection.



#### EASY NAVIGATION – VARIOUS COLORS

Assists by enhanced visual capability in darkest environments, allows for increased manoeuvring when twilight docking, long range distance awareness in low light conditions.



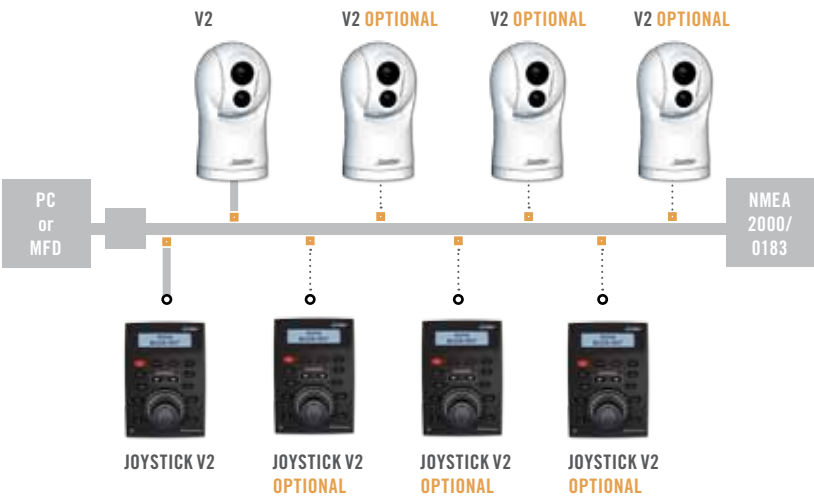
GO TO PAGE 52 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





SECURITY AND SURVEILLANCE

From detecting pirates on the high seas to surveillance when docked at the local marina, thermal cameras can identify predators in the dark, providing enhanced security and situational awareness for your vessel and crew. Plus, with comprehensive multi-zone monitoring, thermal imaging offers a heightened ability to detect icebergs and fire to help avoid unfortunate collisions or accidents.



UNIVERSAL COMPATIBILITY

V2 has an unmatched flexibility for NMEA 2000 and NMEA 0183 interfacing. Additional optional accessories allow for seamless connection and control to PCs and Furuno Navnet network.

GYRO STABILIZED  
CRYSTAL CLEAR VISION

- > Up to four remote joystick control unit stations
- > V2: 320x240 image resolution with dual camera
- > V5: 640x480 image resolution with dual camera
- > Rugged construction that exceeds military standards to operate in challenging navigation environment and man overboard rescues with increased situational awareness
- > Low-lux, high-resolution integrated camera with 36x optical zoom coupled with 10x digital zoom for sharp magnification up to 360x
- > Flexible mounting via gimbal sphere, up or down

IMPROVED SAFETY

In the unfortunate event an individual falls overboard, thermal night vision cameras can dramatically reduce rescue times by helping quickly locate the fallen person in the water.

IMPROVED SAFETY

- > Crisp thermal images
- > Multi-level backlit LCD and illuminated keypad for night applications
- > Continuous 360° pan and +/- 90° tilt with auto flip provides commanding aid in twilight hours and allows for optimal maneuvering for docking inside marina
- > Rugged lightweight aluminum design or plastic enclosure with mono-crystalline germanium tempered glass embedded with hard carbon plating technology, weather proof to IP67
- > Multiple thermal display (Black Hot, White Hot, Sepia, Fusion, Rainbow) and scene (Night, Sunlight, Man Overboard, Night Docking) selection modes
- > NTSC or PAL selectable via keypads
- > Flexible mounting via gimbal sphere, up or down
- > Programmable home position and other positions including easy to set auto scan routines
- > Thermal and low light simultaneous view on single or multiple displays
- > Multi-language capability



OIL SPILL DETECTION AND RECOVERY

Thermal camera technology can detect oil floating along the surface of water, which allows oil recovery units to operate non-stop.

JOYSTICK CONTROL UNIT

Featuring smooth, effortless camera control, even in rough seas, the ergonomic joystick controller provides ready access to all critical system functions for efficient operation.

ACTUAL VIEW AND THERMAL NIGHT VISION



V2 JOYSTICK CONTROLLER

COMING SOON – PRODUCT INNOVATION

V5 JOYSTICK CONTROLLER



- > 640x480 screen resolution embedded with dual camera control
- > Easy touch electronic zoom via proportional joystick control keypad



GO TO PAGE 52 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS



“Take it anywhere – in addition to our low light and thermal vision camera, the handheld binocular served us so well during our docking maneuver at night, it made us feel incredibly safe...”



# HV SERIES

*Handheld Camera*

With specific features and superior functions, ComNav’s new HV Series sets a new standard for small, light weight handheld thermal imaging cameras. A monocular or binocular is the ideal companion for day-and-night viewing, whether it is security surveillance, search and rescue or wildlife observations, off shore or on land. A well-sealed housing with good encapsulation fulfills the requirements of any tough operation and provides thermal imaging for clear vision and navigation assistance in total darkness and through smoke and light fog. CE and RoHS certified, and with an extended 2-year warranty, these sophisticated multi-function accessories will serve you well anywhere you go.



GO TO PAGE 54 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





MONOCULAR  
HV 100 / HV 125 / HV 150

LIVE VIDEO RECORDING

A thermal image and video storage function with date and time information allows for IR video recording that can be saved and reviewed at later times. The pocket size monocular comes with a removable storage card, so pictures and videos can be stored anywhere.

MORE THAN MARINE NIGHT VISION

As the HV Series is not mounted permanently to the vessel and due to its rugged, all-weather design, it can be taken anywhere you need to see clearly after dark. Use it to investigate sounds in the back yard, or to make sure nobody is approaching uninvited. Take it camping or hiking to watch wildlife you would otherwise miss due to natural camouflage.



RUGGED AND PORTABLE  
VISION AT NIGHT

- > Available in 25mm and 50mm lens options
- > 2x electronic zoom
- > Adjustable contrast and brightness LCD colour display
- > 40% increased image resolution with 384 x 288 over 320 x 240
- > 50 Hz high image frequency
- > Wide object detection range up to 2.9 km
- > White Hot/Black Hot Switch
- > Runs off re-chargeable batteries with low power consumption and displays video on built in screen
- > Multi choice versions for different detection requirements

ACTUAL VIEW AND THERMAL NIGHT VISION



GOES ANYWHERE  
WHERE YOU NEED  
TO SEE AT NIGHT

- > Available in 61mm and 80mm lens options
- > 2x electronic zoom
- > Adjustable contrast and brightness OLED view finer display
- > 40% increased image resolution with 384 x 288 over 320 x 240
- > 50 Hz high image frequency
- > Wide object detection range up to 4.65 km
- > White Hot/Black Hot Switch
- > Runs off re-chargeable batteries with low power consumption and displays video on built in screen
- > Freeze frame functions for greater image utility
- > Multi choice versions for different detection requirements
- > USB 2.0 interface for fast and convenient data transfer



BINOCULAR  
HV 260 / HV 280



EASY TOUCH CONTROL PANEL

An easy touch control panel provides direct, push-button access to all camera functions, making it easy to use and comfortable to operate: adjust the brightness of the internal viewfinder to enhance the operator's night vision; toggle the image display between white-hot and black-hot with a polarity button; toggle the 2x electronic zoom on and off; activate the freeze frame function, or capture still images and video via picture button; turn the HV Series on and off, or put it into power-saving standby mode.

EXTREME DETECTION RANGE PERFORMANCE

HV 260 (10° LENS)	
MAN	1.37 km / 0.85 mi (4,494 ft)
SMALL VESSEL	3.32 km / 2.1 mi
HV 280 (7° LENS)	
MAN	1.92 km / 1.2 mi (6,299 ft)
SMALL VESSEL	4.65 km / 2.9 mi

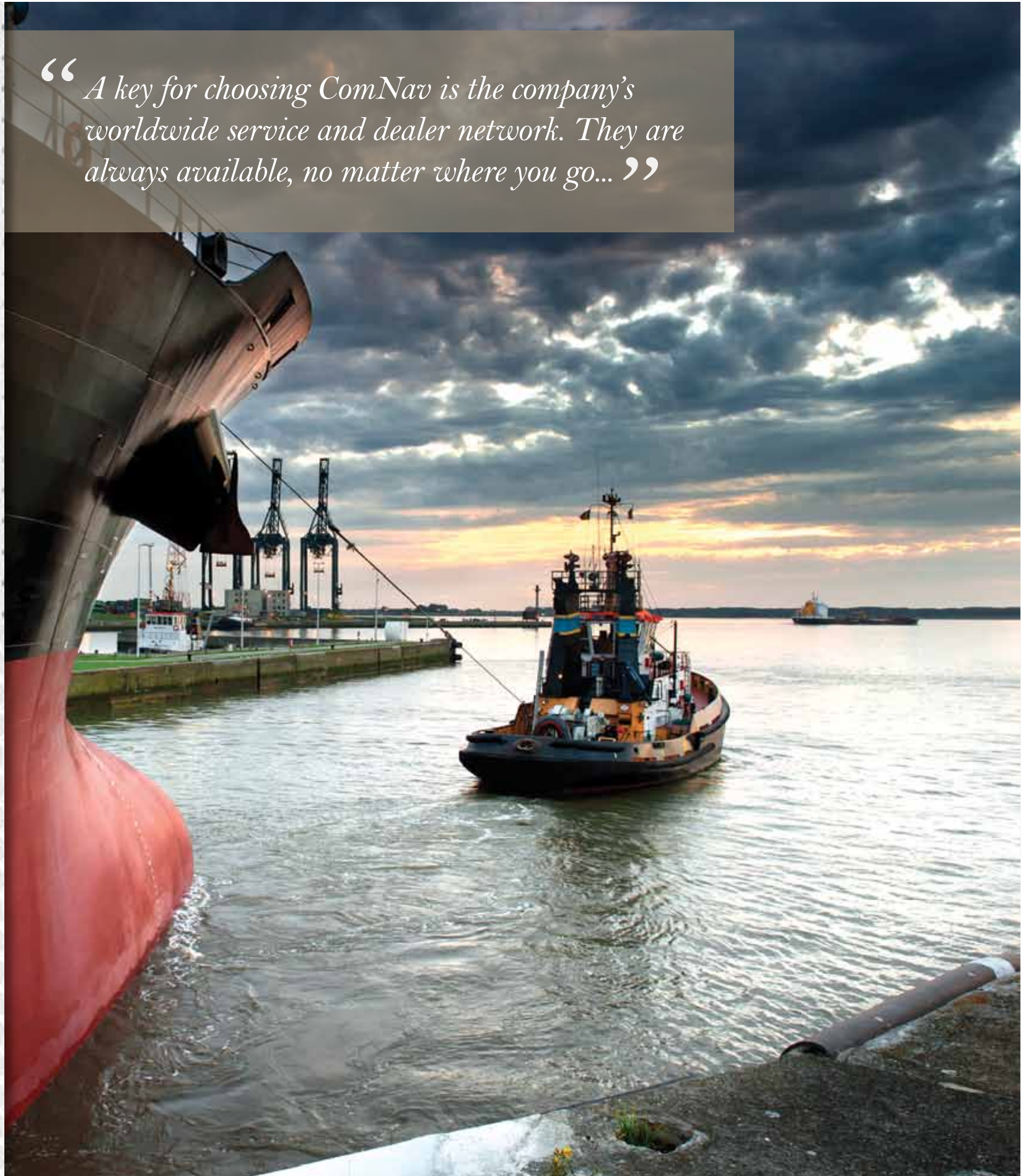


BINOCULAR  
HV 260 / HV 280



GO TO PAGE 54 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





“A key for choosing ComNav is the company’s worldwide service and dealer network. They are always available, no matter where you go...”

# C SERIES

## Marine Monitors + Tablets

Featuring an exceptionally bright, full colour LCD display with anti-glare protection glass and optical bonding reflection-reducing technology, ComNav Marine Monitors minimize glare for enhanced navigation in everything from tropical sunlight to ambient low-light conditions. With a superior thermal channel design, ComNav’s monitors run cooler than standard models and have built-in auto heaters to withstand extreme cold weather.

The Rugged Tablet PC is manufactured with an industrial grade, high-resolution TFT LCD panel, while the C, CS and CT Series offer the versatility to be used as a powerful single function display, or can be converted into a complete single screen navigation system.

All ComNav monitors are FCC certified and meet CE requirements. These devices feature waterproof integrity compliant to IP67 standards, marine grade corrosion resistant connectors and shock and vibration proof rugged military specifications. For a reliable outdoor marine navigation device, ComNav Marine Monitors are the way to go.

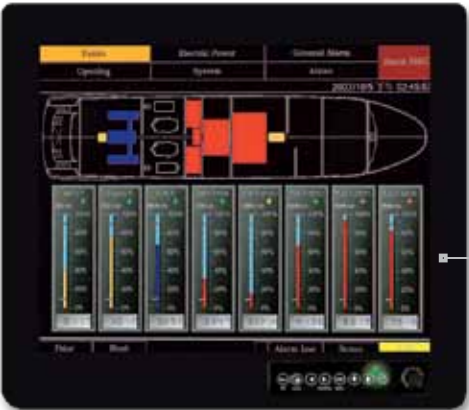


GO TO PAGE 55 FOR FULL PRODUCT SPECIFICATIONS AND COMPARISONS





CS12, CS15, CS19  
(SLIM LINE)



C12, C15, C19, C23

TOUCH SCREEN DESIGN FOR SUPERIOR PERFORMANCE

A state-of-the-art touch screen design featuring universal flush or pedestal mounting, compliments any helm design, while substantial housing and waterproof connections are engineered for superior performance in harsh environments.



CRYSTAL CLEAR  
PRESENTATION

- > 1400 nit sunlight readable white luminescence LED backlit monitors for increased reliability and longevity of C Series
- > 800 nit daylight viewable LCD for enhanced visibility of C Series
- > Resolution up to 1600 x 1200
- > Hyper dimming – backlight brightness knob control from 0% to 100%
- > Multi scan function with wide range of inputs: multi-video, DVI, VGA, S-video, Picture in Picture (PIP) function
- > On screen display (OSD) control provides user-friendly front panel access
- > Wide angle viewing
- > Supports 12-36 VDC or 110/240 VAC power supply
- > 12”, 15” and 19” models

RUGGED TABLET  
FOR MARINE OUTDOORS

- > Crystal clear readable touch screen in sunlight
- > Low power chipset LCD display technology
- > Resolution up to 1024 x 768
- > HotTab application software with programmable hotkey design
- > Wireless communication: WLAN, Bluetooth, Wi-Fi and WWAN and external expansion by PCI-Express, PCMCIA or USB
- > Fanless chipset solution – thermal design for low surface temperature



ERGONOMIC AND PORTABLE

With aluminum-magnesium alloy housing designed to withstand shock and vibration, the CT Series offers a quick and easy snap-in battery pack and AC adapter. This model is available with an optional universal mount ram or multi-functional VESA swivel mount, which comes with a charging dock station. Boaters can enjoy enhanced mobility with optional accessories such as a shoulder strap, hand strip, keyboard and mouse.



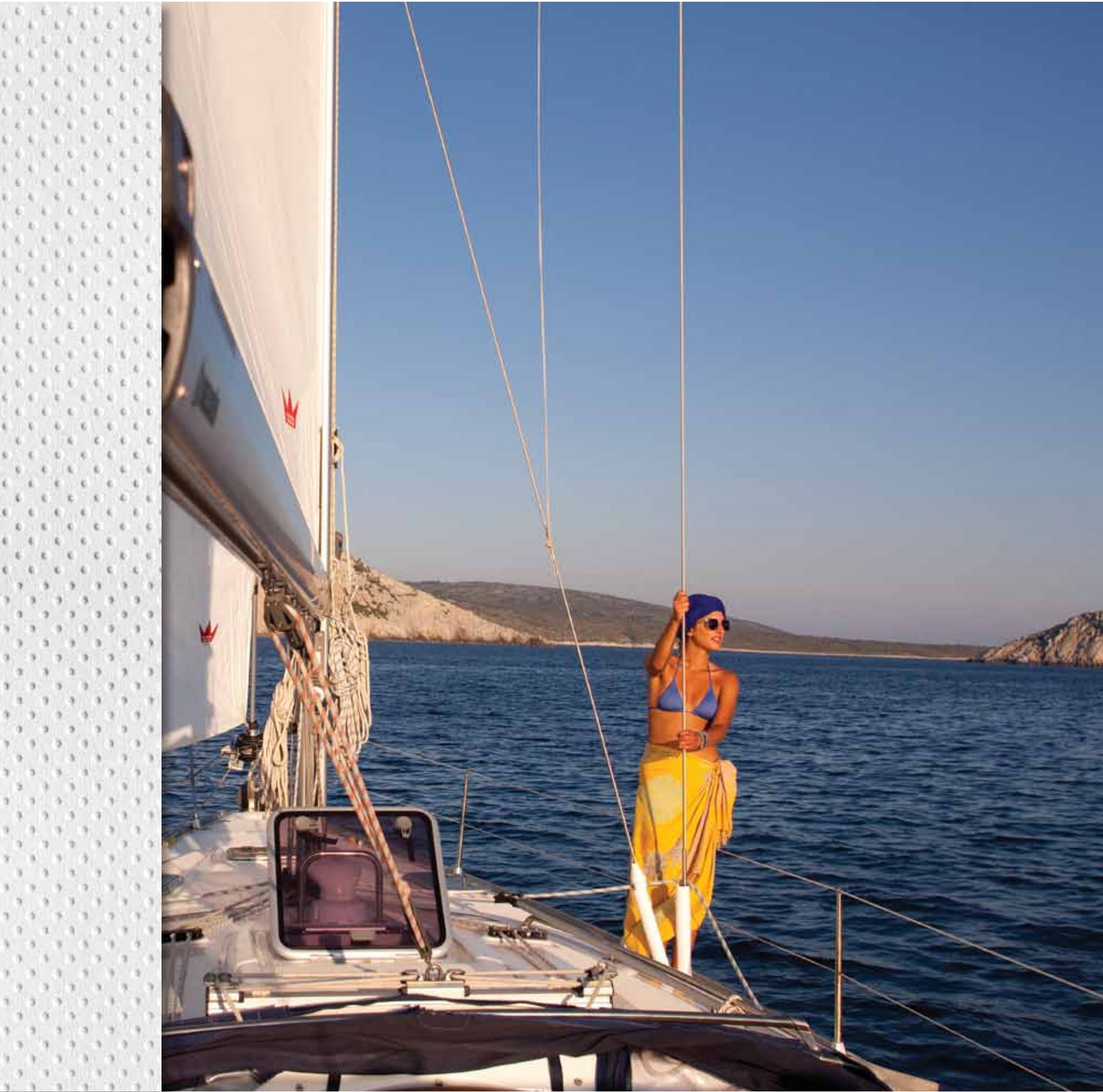
CT10

CT12



GO TO PAGE 55 FOR FULL PRODUCT  
SPECIFICATIONS AND COMPARISONS





# SPECIFICATIONS

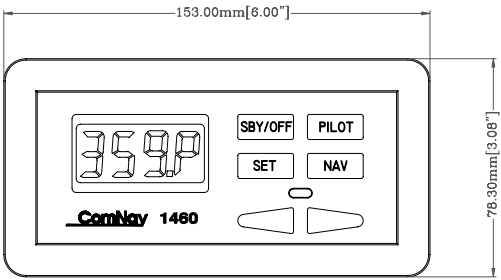
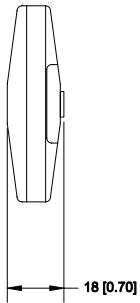
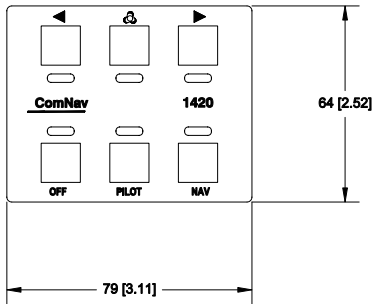
Meeting stringent International Standards our product specifications speak for themselves and provide a real peace of mind.

*Disclaimer: At the time of this catalogue printing, some of the certification approvals are currently pending for product models V2, V5, NX3 Displays and G3 Display. For all products, specifications are subject to change without notice.*






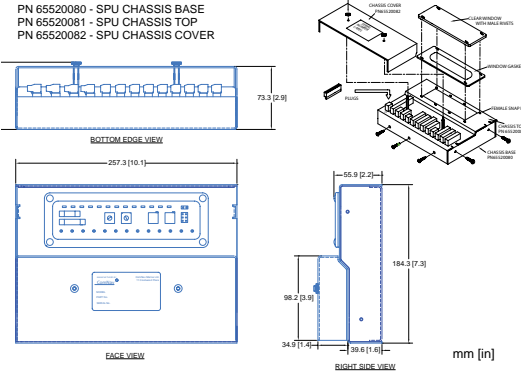
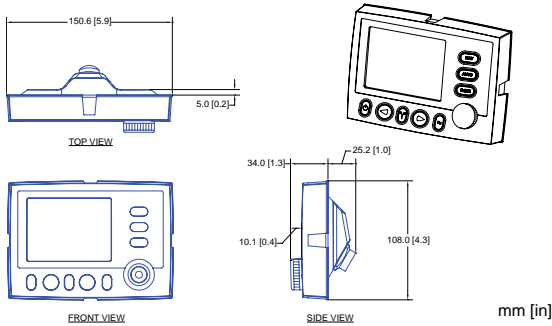
	1420	1440*	1460*
			
<b>Specifications</b>			
Operating Voltage	10-40 VDC	10-40 VDC	10-40 VDC
Power Consumption	average 3 A, peak 20 A	average 3 A, peak 20 A	average 3 A, peak 20 A
Solenoid Output	max. 20 A	max. 20 A	max. 20 A
DC Reversing Pump	max. 20 A	max. 20 A	max. 20 A
Bypass Valve / Clutch Output	max. 3 A	max. 3 A	max. 3 A
Navigational Interface	NMEA 0183	NMEA 0183	NMEA 0183
Heading Reference	Fluxgate / Magnetic Compass	Fluxgate	Fluxgate
Course Resolution	1°	1°	1°
Course Detection	0.25°	0.25°	0.25°
Compliance	CE	CE	CE
<b>Dimensions</b>			
Control Unit	79x64x18 mm 3.1x2.5x0.7 in	70x133x25 mm 2.7x5.2x1.0 in	152x25x79 mm 6.0x1.0x3.1 in
Processor Unit	160x380x70 mm 6.3x15.0x2.7 in	160x380x70 mm 6.3x15.0x2.7 in	160x380x70 mm 6.3x15.0x2.7 in
Fluxgate Compass	142x107x76 mm 5.6x4.2x3.0 in	142x107x76 mm 5.6x4.2x3.0 in	142x107x76 mm 5.6x4.2x3.0 in
Pump	122x191x102 mm 4.8x7.5x4.0 in	122x191x102 mm 4.8x7.5x4.0 in	122x191x102 mm 4.8x7.5x4.0 in

\* not available in North America






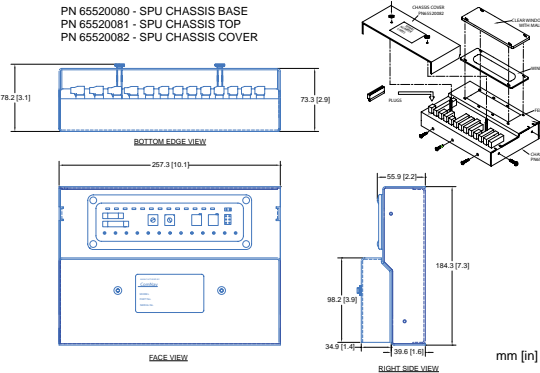
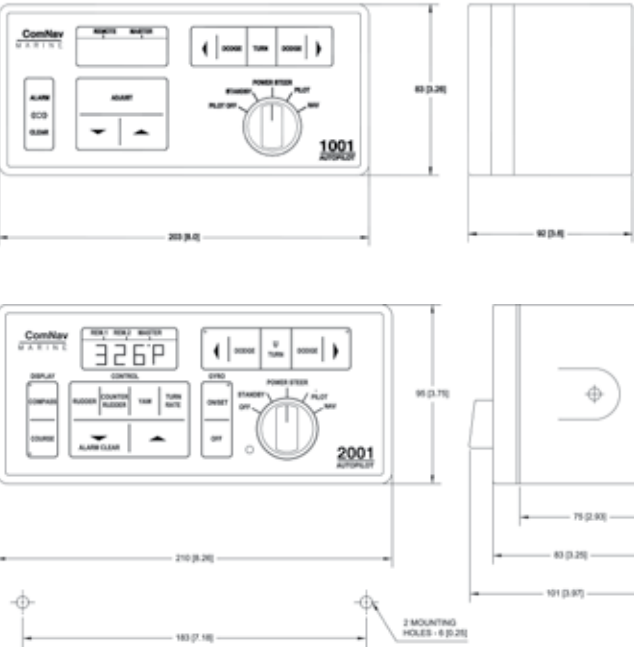
mm [in]  
0.50 kg [0.12 lb]

	1500	COMMANDER P2	COMMANDER P2VS
			
<b>Specifications</b>			
Operating Voltage	11-28 VDC	10-30 VDC	11-30 VDC
Power Consumption	4 W	average 0.5 A, peak 3 A	average 0.5 A, peak 3 A
Solenoid Output	max. 25 A	max. 20 A	max. 20 A
DC Reversing Pump	max. 25 A	max. 20 A	max. 20 A
Bypass Valve / Clutch Output	max. 5 A	max. 5 A	max. 5 A
Drive Output	20 A	20 A	20 A
Navigational Interface	NMEA 0183	dual NMEA 0183	dual NMEA 0183
Heading Output	NMEA 0183	NMEA 0183 heading 10Hz, status 1Hz	NMEA 0183 heading 10Hz, status 1Hz
Heading Reference	Fluxgate	Fluxgate / Magnetic Compass / NMEA Compass / G2-G2B GPS Compass / SSRC	Fluxgate / SSRC
Course Resolution	1°	1°	1°
Course Detection	0.1°	0.1°	0.1°
Control Head	—	Sunlight high contrast LCD c / mc, QVGA 320x240	Sunlight high contrast LCD c / mc, QVGA 320x240
Compliance	CE	CE	CE
<b>Dimensions</b>			
Control Unit	110x25.4x110 mm 4.33x1.0x4.33 in	155x113x29 mm 6.1x4.5x1.2 in	155x113x29 mm 6.1x4.5x1.2 in
Processor Unit	—	257x184x73 mm 10.2x7.3x2.9 in	257x184x73 mm 10.2x7.3x2.9 in
Distribution Unit	220.98x175.26x55.88 mm 8.7x6.9x2.2 in	—	—
Fluxgate Compass	108x49 mm 4.2x1.9 in	142x107x76 mm 5.6x4.2x3.0 in	142x107x76 mm 5.6x4.2x3.0 in
Pump	—	122x191x102 mm 4.8x7.5x4.0 in	122x191x102 mm 4.8x7.5x4.0 in

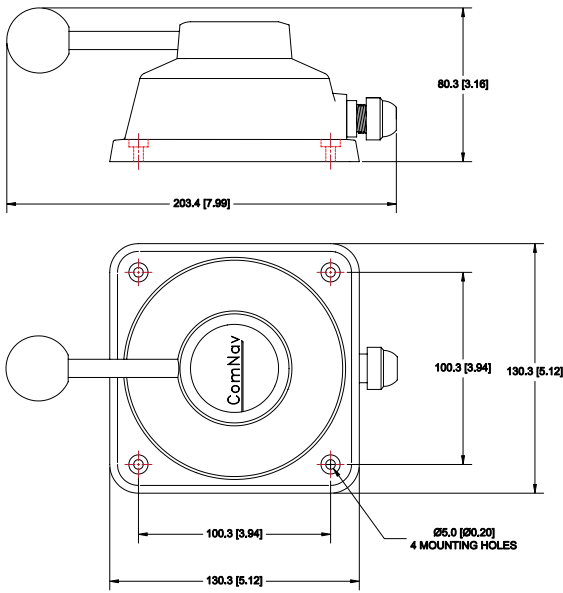
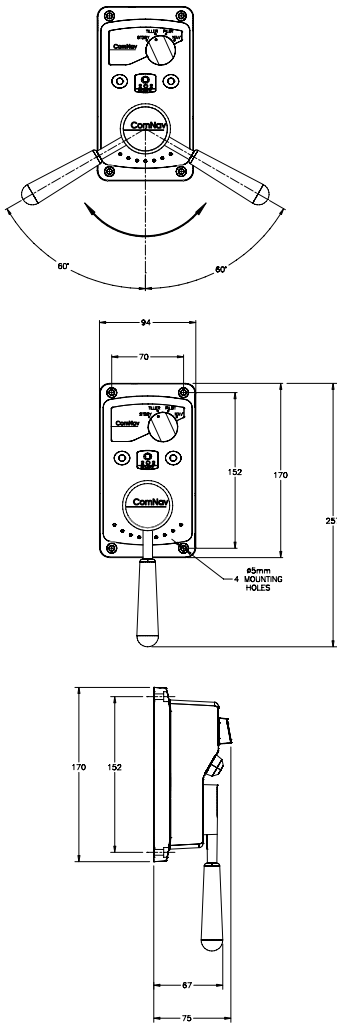




	1001	2001	ADMIRAL P3
			
<b>Specifications</b>			
Operating Voltage	12 or 24 VDC	12 or 32 VDC	10-30 VDC
Power Consumption	average 0.5 A, peak 3 A	average 0.5 A, peak 3 A	average 0.5 A, peak 3 A
Solenoid Output	max. 3 A	max. 3 A	—
DC Reversing Pump	optional	optional	20 A
Bypass Valve / Clutch Output	max. 3 A	max. 3 A	max. 5 A
Drive Output	optional	optional	max. 20 A
Navigational Interface	NMEA 0183	NMEA 0183	dual NMEA 0183
Heading Output	—	NMEA 0183 and AD 10S	NMEA 0183 heading 10Hz, status 1Hz
Heading Reference	Fluxgate / Magnetic Compass	Fluxgate / Magnetic Compass	Fluxgate / Magnetic Compass / NMEA Compass / G2-G2B GPS Compass
Course Resolution	1°	1°	1°
Course Detection	0.25°	0.25°	0.1°
Control Head	—	—	Sunlight high contrast colour LCD QVGA 320x240
Compliance	CE	—	Wheelmark, IMO, CE
<b>Dimensions</b>			
Control Unit	203x83x92 mm 8.0x3.26x3.6 in	210x95x83 mm 8.25x3.75x3.25 in	155x113x29 mm 6.1x4.5x1.2 in
Processor Unit	—	—	257x184x73 mm 0.2x7.3x2.9 in
Distribution Unit	114x133x25 mm 4.6x5.25x1.0 in	114x133x25 mm 4.6x5.25x1.0 in	—
Fluxgate Compass	142x107x76 mm 5.6x4.2x3.0 in	122x102 mm 4.8x4.0 in	—




	203	TS-203	NFU JOG SWITCH
			
Supply Voltage	10-14 VDC	10-14 VDC	125 VAC
Supply Current	nominal 60 mA, max. 100 mA	nominal 40 mA	10 A
Operation Temperature	-20°C to +70°C	-40°C to +85°C	—
Storage Temperature	-30°C to +85°C	-40°C to +100°C	—
Mounting	Keyhole screw	Deck / Bulkhead Surface	—
Safe Distance to Compass	30 cm / 12 in	—	—
Switches	—	—	Single Pole / Single Throw
Switching	—	—	3 Position, Center Off, Spring Return
Housing	—	—	ABS Plastic, Watertight
Dimensions	82x155x54 mm 3.2x6.1x2.13 in	257x94x75 mm 10.12x3.7x2.96 in	203.4x130.3x80.3mm 7.99x5.12x3.16 in
Weight	410 g / 14.4 oz	690 g / 24 oz	0.6 kg / 1.3 lbs
Standard Cable Length	12 m / 40 ft or 18 m / 60 ft	12 m / 40 ft	1.5 m / 5 ft
Optional Cable Length	—	30 m / 100 ft	—

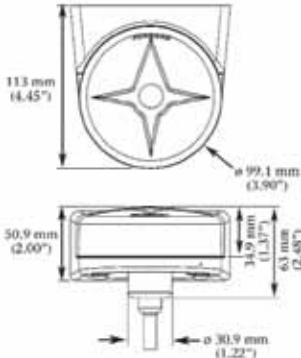
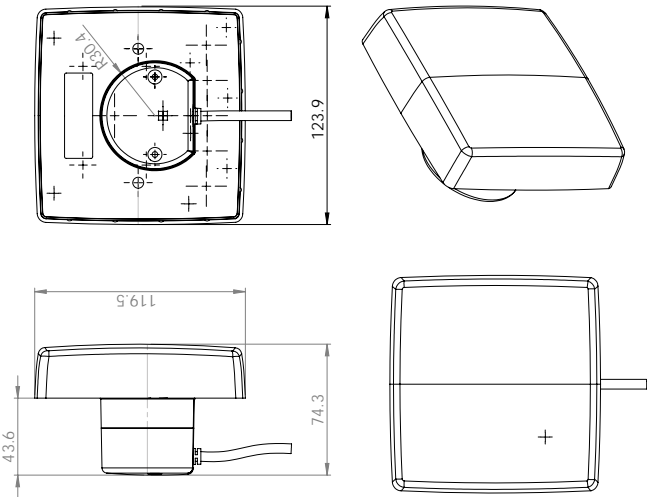






	NX3 SAIL	NX3 30 SAIL	NX3 POWER
			
Resolution	480x272	800x480	480x272
Viewing Angles	Horizontal 80° from each side, vertical 80° from above / 60° from below	Horizontal 80° , vertical 60°	Horizontal 80° from each side, vertical 80° from above / 60° from below
Backlight	White LED	White LED	White LED
Cable	1 m or 6 m NMEA 2000 drop cable	1 m or 6 m NMEA 2000 drop cable	1 m or 6 m NMEA 2000 drop cable
Operating Voltage	9 - 18 VDC	9 - 18 VDC	9 - 18 VDC
Power Consumption	Max. 3 W	Max. 6 W	Max. 3 W
Data Interface	NMEA 2000	NMEA 2000	NMEA 2000
NMEA 2000 Load Equivalency Number (LEN)	5 (250 mA)	max. 400 mA	5 (250 mA)
Device Class	80	80	80
Certification	Class 1	Class 1	Class 1
Device Level	A	A	A
Keypad	5 buttons	none	5 buttons
Operating Temperature	-15°C to +55°C	-15°C to +55°C	-15°C to +55°C
Storage Temperature	+30°C to +70°C	+30°C to +70°C	+30°C to +70°C
Dimensions	120x110 mm	180x118 mm	120x110 mm
Display	4.3 in, coulour TFT-LCD	7.0 in, colour TFT-LCD	4.3 in, coulour TFT-LCD

	SSRC COMPASS
	
<b>Specifications</b>	
Static Compass Accuracy	< 1° RMS
Dynamic Compass Accuracy	< 2° RMS
Heading Display Resolution	0.1°
Settling Time	1 sec
Heading Data Output Update Rate	10 Hz NMEA 0183, up to 20 Hz NMEA 2000
Rate of Turn Range	0-70° / sec
Rate of Turn Accuracy	1° / sec
Rate of Turn Data Output Update Rate	2 Hz NMEA 0183, adjustable up to 10 Hz, up to 20 Hz NMEA 2000
Pitch / Roll Range	+/-50°
Static Pitch / Roll Accuracy	< 1°
Dynamic Pitch / Roll Accuracy	< 3°
Pitch / Roll Display Resolution	0.1°
Pitch / Roll Boat Alignment	yes, with software
Pitch / Roll Data Output Update Range	2 Hz NMEA 0183, adjustable up to 10 Hz, up to 20 Hz NMEA 2000
NMEA Heading Messages	NMEA 0183 supported sentence structure \$HCHDG, \$HCHDT, \$TIROT, \$YXXDR, and NMEA 2000 supported PGN's 127250, 127251, 127257
<b>Power</b>	
Input Voltage	9-16 VDC
Current Consumption	< 140 mA
Compliance	CE, IPX6, RoHS, IEC60945
Dimensions	113x63 mm / 4.45x2.48 in

	SPEED LOG/TEMP	TRIDUCER SPEED/DEPTH/TEMP
		
<b>Specifications</b>		
Range	Speed 2-45 knots / 2-25 mph	Depth min. 0.5 m / 1.6 ft, max. 70 m / 230 ft NMEA 0183, max. 100 m / 330 ft NMEA 2000
Acoustic Window	Urethane	Urethane
Hull Deadrise	< 22°	< 22°
Data Update Range	1/sec	1/sec
Pressure Rating	3 m 10 ft	3 m 10 ft
Pulse Rate	4.8 Hz per knot	5.6 Hz per knot
Operating Voltage	9-16 VDC	10-25 VDC NMEA 0183, 9-16 VDC NMEA 2000
Power Consumption	< 200 mA	< 40 mA NMEA 0183, < 200 mA NMEA 2000
Temperature Sensor Accuracy	+/- 0.5°C	+/- 0.5°C
Temperature Sensor Range	-10°C to +40°C	-10°C to +40°C
NMEA 2000 Load Equivalency Number (LEN)	2	4
Data Output Protocol	Analog paddlewheel format or NMEA 2000 supported PGNs (59392, 600928, 126208, 126464, 126996, 128259, 128275, 130310, 130311, 130312)	NMEA 0183 Sentence Structure (\$SDBT, DDPT, \$VWVHW, \$VWVLW, \$YXMTW), NMEA 2000 supported PGNs (59392, 600928, 126208, 126464, 126996, 128259, 128267, 128275, 130310, 130311, 130312)
Dimensions	124x75 mm 4.88x2.95 in	130x75 mm 5.12x2.95 in
Weight	0.7 kg / 1.4 lbs - plastic, 1.3 kg / 2.8 lbs - bronze, 1.6 kg / 3.5 lbs - stainless stee	0.9 kg / 2.0 lbs - plastic, 1.6 kg / 3.5 lbs - bronze, 1.9 kg / 4.2 lbs - stainless steel
Standard Cable Lenght	6 m / 20 ft NMEA 2000 9 m / 30 ft analog	6 m / 20 ft NMEA 2000, 10 m / 33 ft NMEA 0183
Thread Size on Base	—	—
CE Regulation	IERC60945	IERC60945



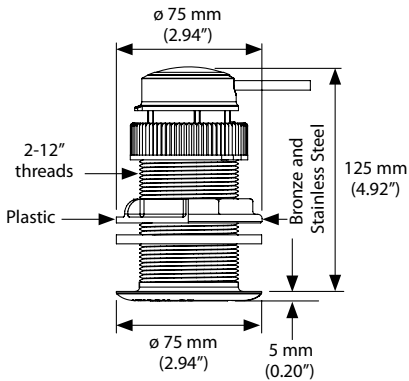


	DEPTH	WIND TRANSDUCER, WEATHER STATION
		
<b>Specifications</b>		
Range	Depth min. 0.5 m / 1.6 ft, max. 100 m / 330 ft non-Broadband, max. 180 m / 590 ft Broadband	Wind 0-80 knots
Acoustic Window	Urethane	—
Hull Deadrise	< 22°	—
Data Update Range	1/sec	—
Pressure Rating	3 m 10 ft	—
Operating Voltage	10-25 VDC NMEA 0183 9-16 VDC NMEA 2000	9-16 VDC
Power Consumption	< 40 mA NMEA 0183, < 200 mA NMEA 2000	< 220 mA
Temperature Sensor Accuracy	+/- 0.5°C	—
Temperature Sensor Range	-10°C to +40°C	-25°C to +55°C
NMEA 2000 Load Equivalency Number (LEN)	4	5
Data Output Protocol	NMEA 0183 Sentence Structure (\$SDBT, DDPT, \$YXMTW), NMEA 2000 supported PGNs (59392, 600928, 126208, 126464, 126996, 128267, 130310, 130311, 130312)	NMEA 0183 Sentence Structure (\$GPDTM, \$GPGGA, \$GPGLL, \$GPGSA, \$GPGSV, \$GPRMC, \$GPVTG, \$GPZDA, \$HCHDG, \$HCHDT, \$TIROT, \$WIMDA, \$WIMWD, \$WIMWV, \$WIMWR, \$WIMWT, \$YXXDR), NMEA 2000 supported PGNs (59392, 060928, 126208, 126464, 126992, 126996, 126998, 127250, 127251, 127257, 127258, 129025, 129026, 129029, 129033, 129044, 129538, 129539, 129540, 130306, 130310, 130311, 130323)
Wind Speed Resolution	—	0.1 knots
Wind Speed Accuracy, no precipitation, 0°C to +55°C	—	low wind speeds 0-10 knots RMS error of 1 knot +10% of reading, high wind speeds 10-80 knots RMS error of 2 knots or 5% RMS, whichever is greater
Wind Speed Accuracy, wet conditions	—	5 knots
Wind Direction Range	—	0-360°
Wind Direction Resolution	—	0.1°
Wind Direction Accuracy, no precipitation, 0°C to +55°C	—	low wind speeds 4-10 knots 5° RMS typical, high wind speeds > 10 knots 2° RMS typical
Wind Direction Accuracy, wet conditions	—	> 8 knots 8° RMS typical

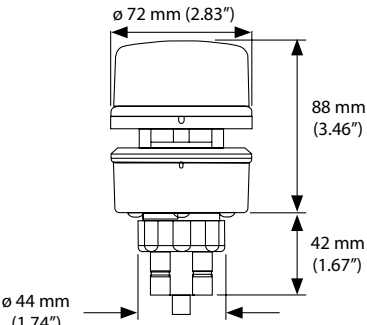
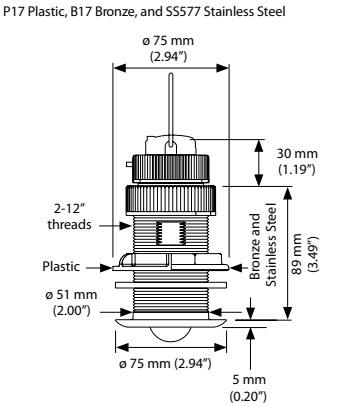
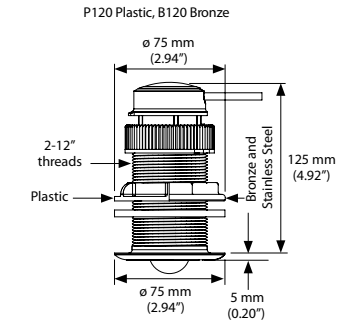
CONTINUED ON NEXT PAGE >

	DEPTH	WIND TRANSDUCER, WEATHER STATION
		
Compass Accuracy	—	1° static, 2° dynamic
Rate of Turn	—	0-70°/sec
Rate of Turn Accuracy	—	1°/sec
Rate of Turn Data Output Update Rate	—	2 Hz NMEA 0183, < 20 Hz NMEA 2000
Pitch and Roll Accuracy	—	+/-50° / < 1°
Air Temperature Range	—	-25°C to +55°C
Air Temperature Resolution	—	0.1°C
Air Temperature Accuracy	—	+/-1°C > 4 knots
Barometer Pressure Range	—	850-1150 mbar
Barometric Pressure Resolution	—	0.1 mbar
GPS Position Accuracy	—	3 m / 10 ft with WAAS, EGNOS
Baud Rate	—	4800 - 38400
Dimensions	130x75 mm 5.12x2.95 in	130x72 mm 5.12x2.84 in
Weight	0.9 kg / 2.0 lbs - plastic, 1.5 kg / 3.4 lbs - bronze, 1.6 kg / 3.6 lbs - stainless steel	0.285 kg 0.7 lbs
Standard Cable Lenght	6 m / 20 ft NMEA 2000, 10 m / 33 ft NMEA 0183	—
Thread Size on Base	—	1" 14 UNS standard marine mount
CE Regulation	IERC60945	CE, IPX6, RoHS, NMEA 2000, IEC61000-4-2, IEC60945



P617V Plastic, B617V Bronze, and SS617V Stainless Steel



• Also compatible with B17 and SS577 housings



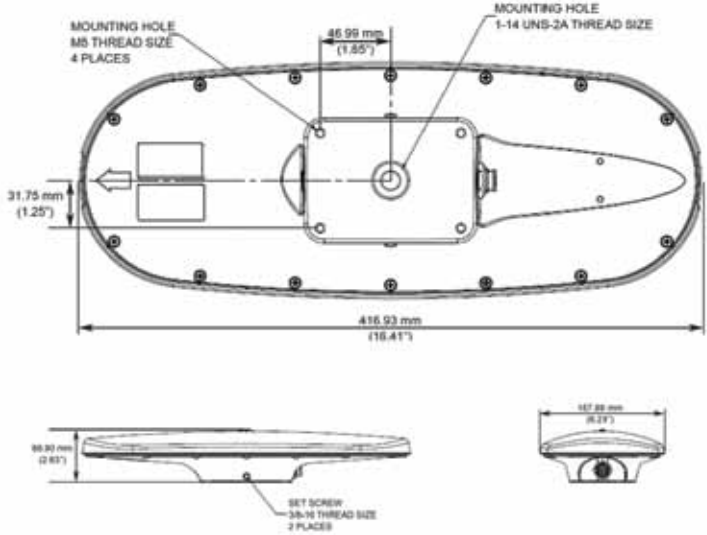


	<b>G1</b>	<b>G2</b>
		
<b>Specifications</b>		
Receiver Type	L1, C/A code, carrier phase smoothing*	L1, C/A code, carrier phase smoothing
Channels	Dual 12-channel parallel	Dual 12-channel parallel
SBAS-Tracking	Dual 10-channel parallel	Dual 10-channel parallel
Update Rate	Standard 10 Hz, optional 20 Hz	Standard 5 Hz, optional 10 Hz
Horizontal Accuracy	< 1.0 m (DGPS)**, < 4.0 m (autonomous, no SBAS)***	< 1.0 m (DGPS)**, < 2.5 m (autonomous, no SBAS)***
Heading Accuracy	approx. 0.6°	approx. 0.5°
Pitch / Roll Accuracy	approx. 1.4°	approx. 1°
Heave Accuracy	< 30 cm	< 30 cm
Rate of Turn	max. 90°/sec	max. 90°/sec
Start-up Time	< 60 sec	< 60 sec
Heading Fix	< 10 sec	< 20 sec
Satellite Reacquisition	< 1 sec	< 1 sec
<b>Communications</b>		
Serial Ports	2 full duplex RS-232	2 full duplex RS-232, 2 half duplex RS-422
Baud Rate	4800 - 115200	4800 - 38400
Correction I/O Protocol	RTCM SC-104	RTCM SC-104
Data I/O Protocol	NMEA 0183, NMEA 2000	NMEA 0183
Heading Warning I/O	—	Open relay system indicates invalid heading
NMEA Heading Messages	\$GPHDT, \$HEHDT, \$SHEHDM, \$GPROT, \$GHEROT, \$GPGGA, \$GPGSV, \$GPVTG, \$GPRMC, \$GPZDA, \$PASHR	\$GPHDT, \$GPROT, \$PSAT, \$GPHDM, \$GPHDG
<b>Environmental</b>		
Operating Temperature	-30°C to +70°C / -22°F to +158°F	-32°C to +74°C / -25°F to +165°F
Storage Temperature	-40°C to +85°C / -40°F to +185°F	-40°C to +85°C / -40°F to +185°F
Humidity	95% non-condensing	100% non-condensing
EMC	FCC Part 1.5, Subpart B, Class B, CISPR22, CE	FCC Part 1.5, Subpart B, Class B, CISPR22, CE, IEC61108-4
<b>Power</b>		
Input Voltage	10 - 36 VDC	10 - 36 VDC
Power Consumption	Nominal < 3 W	< 5 W
Current Consumption	< 250 mA at 12 VDC	< 360 mA at 12 VDC
Power Isolation	Isolated to enclosure	Power supply isolated from serial ports
Reverse Polarity Protection	✓	✓
Power / Data Connection	12-pin, Female, R/A, IP67	18-pin, Environmentally sealed, 15 m or 30 m cable
Weight	1.5 kg / 3.3 lbs	1.5 kg / 3.3 lbs
<b>Aiding Devices</b>		
Gyro Sensor	Reliable < 1° heading for up to 3 min when loss of GPS occurred	Single Axis Gyro for reliable < 1° heading for up to 3 min when loss of GPS occurred
Tilt Sensor	Fast start-up of heading solution	Fast start-up of heading solution

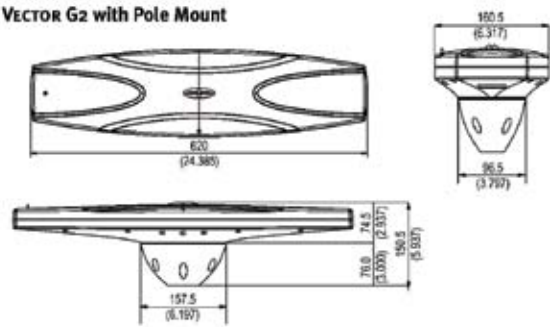
\* Receiver supporting GPS and GLONASS satellite tracking

\*\* depends on multipath environment, antenna selection, number of satellits in view, satellite geometry, baseline length for local service and ionospheric activity

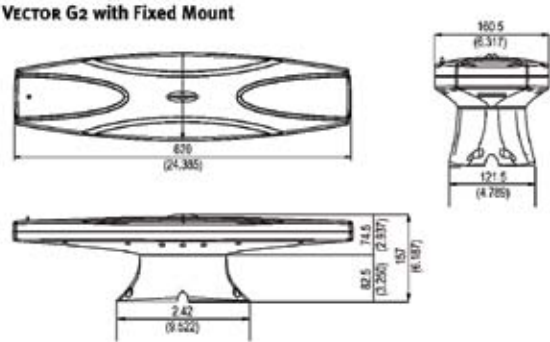
\*\*\* depends on multipath environment, number of satellits in view, satellite geometry




VECTOR G2 with Pole Mount



VECTOR G2 with Fixed Mount







	G2B
	
Specifications	
Receiver Type	L1, C/A code, carrier phase smoothing*
Channels	dual 12-channel parallel
SBAS-Tracking	dual 10-channel parallel
Update Rate	Standard 5 Hz, optional 10 Hz
Horizontal Accuracy	< 1.0 m (DGPS)**, < 2.5 m (autonomous, no SBAS)***
Heading Accuracy	approx. 0.5°
Pitch / Roll Accuracy	approx. 1°
Heave Accuracy	—
Rate of Turn	max. 90°/sec
Start-up Time	< 60 sec
Heading Fix	< 20 sec
Satellite Reacquisition	< 1 sec
Communications	
Serial Ports	2 full duplex RS-232, 2 half duplex RS-422
Baud Rate	4800 - 38400
Correction I/O Protocol	RTCM SC-104
Data I/O Protocol	NMEA 0183
Heading Warning I/O	Open relay system indicates invalid heading
NMEA Heading Messages	\$GPHDT, \$GPROT, \$PSAT, \$GPHDM, \$GPHDG
Environmental	
Operating Temperature	-32°C to +74°C / -25°F to +165°F
Storage Temperature	-40°C to +85°C / -40°F to +185°F
Humidity	100% non-condensing
EMC	—

\* integrated beacon receiver module for terrestrial DGPS signals to enhance positional accuracy

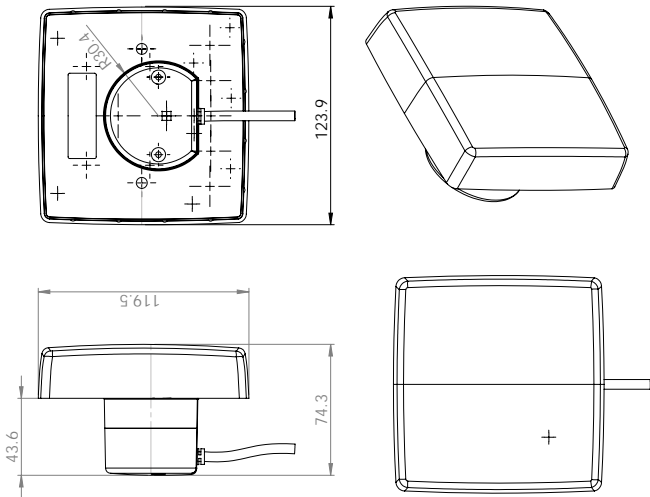
\*\* depends on multipath environment, antenna selection, number of satellits in view, satellite geometry, baseline length for local service and ionospheric activity

\*\*\* depends on multipath environment, number of satellits in view, satellite geometry




	G2 DISPLAY	G3 DISPLAY
		
Specifications		
Operating Voltage	9-12 VDC	9-18 VDC
Power Consumption	average 0.5 A	Max. 3 W
Operating Temperature	-30°C to +80°C	-15°C to +55°C
Storage Temperature	-30°C to +80°C	+30°C to +70°C
Serial Ports	2 full duplex RS-232, 2 RS-422 output	—
Data Interface	NMEA 0183	NMEA 2000, NMEA 0183 (IEC6112-3)
NMEA Heading Messages	\$GPHDT, \$HEHDT, \$HEHDM, \$GPROT, \$GHEROT, \$GPGGA, \$GPGSV, \$GPVTG, \$GPRMC, \$GPZDA, \$PASHR	\$GPHDT, \$HEHDT, \$HEHDM, \$GPROT, \$GHEROT, \$GPGGA, \$GPGSV, \$GPVTG, \$GPRMC, \$GPZDA, \$PASHR
NMEA 2000 Load Equivalency Number (LEN)	—	5 (250 mA)
Display Modes	Compass Rose, ROT, NAV, GOS Status, Config Menu, Satellite in View	Compass Rose, ROT, NAV, GOS Status, Config Menu, Satellite in View
Clock Data	1 PPS	—
Baud Rate	4800 - 38400	—
Data Update Rate	up to 20 Hz for heading	—
Display	—	4.3 in, colour TFT-LCD
Backlight	—	White LED
Resolution	—	480x272
Viewing Angle	—	Horizontal 80°, vertical 80°
Keypad	—	5 Buttons
Device Level	—	A
Device Class	—	80
Certification	—	Class 1
Compliance	CE, IP67	IMO, CE, IP67
Dimensions		
Control Unit	155x113x29 mm / 6.1x4.5x1.2 in	120x110 mm / 4.7x4.3 in
Distribution Unit	180x120x60 mm / 7.1x4.7x2.4 in	—
Cable Length	7.6 m / 25 ft	1 m or 6 m NMEA 2000 drop cable

\* depends on multipath environment, number of satellites in view, satellite geometry, baseline length (for local services), and ionospheric activity

\*\* depends on multipath environment, number of satellites in view, and satellite geometry







	MARINER X2 CLASS B	MARINER X2 12W CLASS B	VOYAGER X3 CLASS A
			
Specifications			
Operating Voltage	10 - 15 VDC	10 - 15 VDC	12 - 24 VDC
Power Consumption	Average 0.35 A, peak 2 A	12 W	Average 10 W, peak 4.75 A at 12 VDC
NMEA 0183 Interface	38.4k baud bi-directional	38.4k baud bi-directional	38.4k baud bi-directional
RS-232 Interface	38.4k baud bi-directional	38.4k baud bi-directional	38.4k baud bi-directional
Operating Temperature	-25°C to +55°C	-25°C to +55°C	-15°C to +55°C
Connections			
VHF Antenna Connector	SO-239	SO-239	SO-239
GPS Antenna Connector	TNC	TNC	TNC
RS-323 Data Connector	Female, 9 Way D-Type	Female, 9 Way D-Type	Female, 9 Way D-Type
IEC61162 Interfaces, Alarm Relay	—	—	50 Way D-Type Junction Box
Power Connector	—	—	LTWBB-04PMMS-LC7001
NMEA 2000 Connector	—	—	LTWBD-05PMMS-LC7001
NMEA 0183 Data	Colour coded conductors	Colour coded conductors	—
External Switch	Colour coded conductors	Colour coded conductors	—
VHF Transceiver			
Transmitter	Single	Single	Single
Receivers	Dual	Dual	Three (2xAIS, 1xDSC Channel 70)
Frequency Range	156.025 MHz - 162.025 MHz	156.025 MHz - 162.025 MHz	156.025 MHz - 162.025 MHz
Channel Bandwidth	25 kHz	25 kHz	25 kHz
Power Output	33 dBm +/- 1.5 dB	33 dBm +/- 1.5 dB	41 dBm +/- 1.5 dB
Modulation	25 kHz GMSK / 25 kHz AFSK	25 kHz GMSK / 25 kHz AFSK	25 kHz GMSK / 25 kHz AFSK
Data Range	9600 bps GMSK, 1200 bps FSK	9600 bps GMSK, 1200 bps FSK	9600 bps GMSK, 1200 bps FSK
RX Sensitivity	<-107 dBm at 20% PER	<-107 dBm at 20% PER	<-107 dBm at 20% PER
Compliance	FCC, USCG, Type EU, IEC, CE, RoHS	FCC, USCG, Type EU, IEC, CE, RoHS	FCC, USCG, Type EU, IEC, CE, RoHS
Standard and Approvals	IEC60945 Cat C, IEC62287-1 Class B Shipborne Equipment, IEC60945 Environmental, ITU-RM.1371-1 Universal AIS Technical, IEC61162-1 IEC Digital Interfaces, IEC61108-1 GPD Receiver	IEC60945 Cat C, IEC62287-1 Class B Shipborne Equipment, IEC60945 Environmental, ITU-RM.1371-1 Universal AIS Technical, IEC61162-1 IEC Digital Interfaces, IEC61108-1 GPD Receiver	CCNR/ZKR Inland AIS Requirements, IEC60945 Edn. 4.0 Environmental Requirements, IEC61993-2 Class A Shipborne Equipment, IEC61162-1/2 Edn. 2.0 Digital Interfaces, IEC61108-1 GPS Receiver Equipment, ITU-RM.1371-3 Universal AIS Technical Characteristics, NMEA 2000 Standard for Marine Networking
Dimensions	215x150x45 mm / 8.5x5.9x1.8 in	215x150x45 mm / 8.5x5.9x1.8 in	210x105x138 mm / 8.3x4.2x5.4 in
Weight	0.62 kg / 1.35 lbs	—	1.6 kg / 3.5 lbs



	V1C	V1T	V1T HR	V2	V5
					
Low Light Camera					
Detector Type	1/4 in HAD CCD	—	—	1/4 in HAD CCD	
Image Resolution	480 TVL	—	—	—	
Lines of Resolution	—	—	—	752 (H) x 582 (V)	
Minimum Illumination	0.01 Lux / F1.6	—	—	0.01 Lux / F1.4	
Lens	F1.6 - F3.8 f = 3.5-91 mm	15 mm - wider fixed angle view	15 mm - wider fixed angle view	35 mm	
Field of Pan View	48° at 1x, 2.3° at 26x	—	—	48° at 1x, 2.3° at 36x	
Optical Zoom	26x, max. 312x	—	—	36x, max. 360x	
Digital Zoom	12x, max. 312x	—	—	10x, max. 360x	
Mimimum Working Distance	320 mm (wide), 1500 mm (tele)	—	—	—	
Thermal Imaging Performance					
Focal Plane Array Detector	—	Uncooled Amorphous Silicone (a-Si) Microbolometer	Uncooled Amorphous Silicone (a-Si) Microbolometer	Uncooled Vanadium Oxide (Vox) Microbolometer	
Pixel	—	384x288	640x240	320x240	640x480
Field of View	—	30° (H)	30° (H)	20° (H) x 15° (V)	
Electronic Zoom	—	2x, 4x	12x	2x	
Thermal Sensitivity	—	< 50 mK at f / 1.0 at 25°C	< 50 mK at f / 1.0 at 25°C	< 50 mK at f / 1.0 at 25°C 640x480	
Spectral Range	—	8-14 μm	8-14 μm	7.5-13.5 μm	
Focus	—	Fixed	Fixed	Fixed	



	V1C	V1T	V1T HR	V2	V5
					
<b>Specifications</b>					
Camera Finish	White	White	White	Matte White	Silver Grey
Stabilization	Digitally rate stabilized	Digitally rate stabilized	Digitally rate stabilized	Gyro compensated 2 axis internal, adaptively optimized	
Operating Voltage	9 - 15 VDC	9 - 15 VDC	9 - 15 VDC	10 - 30 VDC	
Power Consumption	Max. 15 W	Max. 15 W	Max. 15 W	S tandby 10 W, nominal 25 W, max. 50 W with heaters	
Operating Temperature	-25°C to +70°C	-25°C to +70°C	-25°C to +70°C	-25°C to +55°C	
Storage Temperature	-40°C to +85°C	-40°C to +85°	-40°C to +85°C	-40°C to +85°C	
Relative Humidity	5-90%	—	—	—	
Waterproof	Sealed to IP66 standards, marine cables and corrosion resistant connectors	Sealed to IP66 standards, marine cables and corrosion resistant connectors	Sealed to IP66 standards, marine cables and corrosion resistant connectors	Sealed to IP67 standards, marine cables and corrosion resistant connectors	
Wind Resistance	100 Knots	100 Knots	100 Knots	100 Knots	
Shock Resistance	Mil-PRF-28800F, Class 2 Section 4.5.5.3.1	Mil-PRF-28800F, Class 2 Section 4.5.5.3.1	Mil-PRF-28800F, Class 2 Section 4.5.5.3.	15 g vertical, 9 g horizontal	
Vibration Resistance	Mil-PRF-28800F, Class 2 Section 4.5.5.4.1	Mil-PRF-28800F, Class 2 Section 4.5.5.4.1	Mil-PRF-28800F, Class 2 Section 4.5.5.4.1	Mil-Std-810E Sand and dust proof to Mil-Std-810E, Salt, mist and humidity to IEC60945	
Encapsulation	—	Sand and dust proof to Mil-Std-810E, Salt, mist and humidity to IEC60945	Sand and dust proof to Mil-Std-810E, Salt, mist and humidity to IEC60945	—	
Additional Features	—	—	—	Auto-window de-icing and defrost, lightning and surge protection	
Dimensions	diameter - 13cm / 5.2 in height - 16cm / 6.3 in	diameter - 13cm / 5.2 in height - 16cm / 6.3 in	—	diameter - 21cm / 8.3 in height - 35cm / 13.8 in	
Compliance	CE, FCC, RoHS	CE, FCC, RoHS	CE, FCC, RoHS	CE, FCC, RoHS - approval pending	

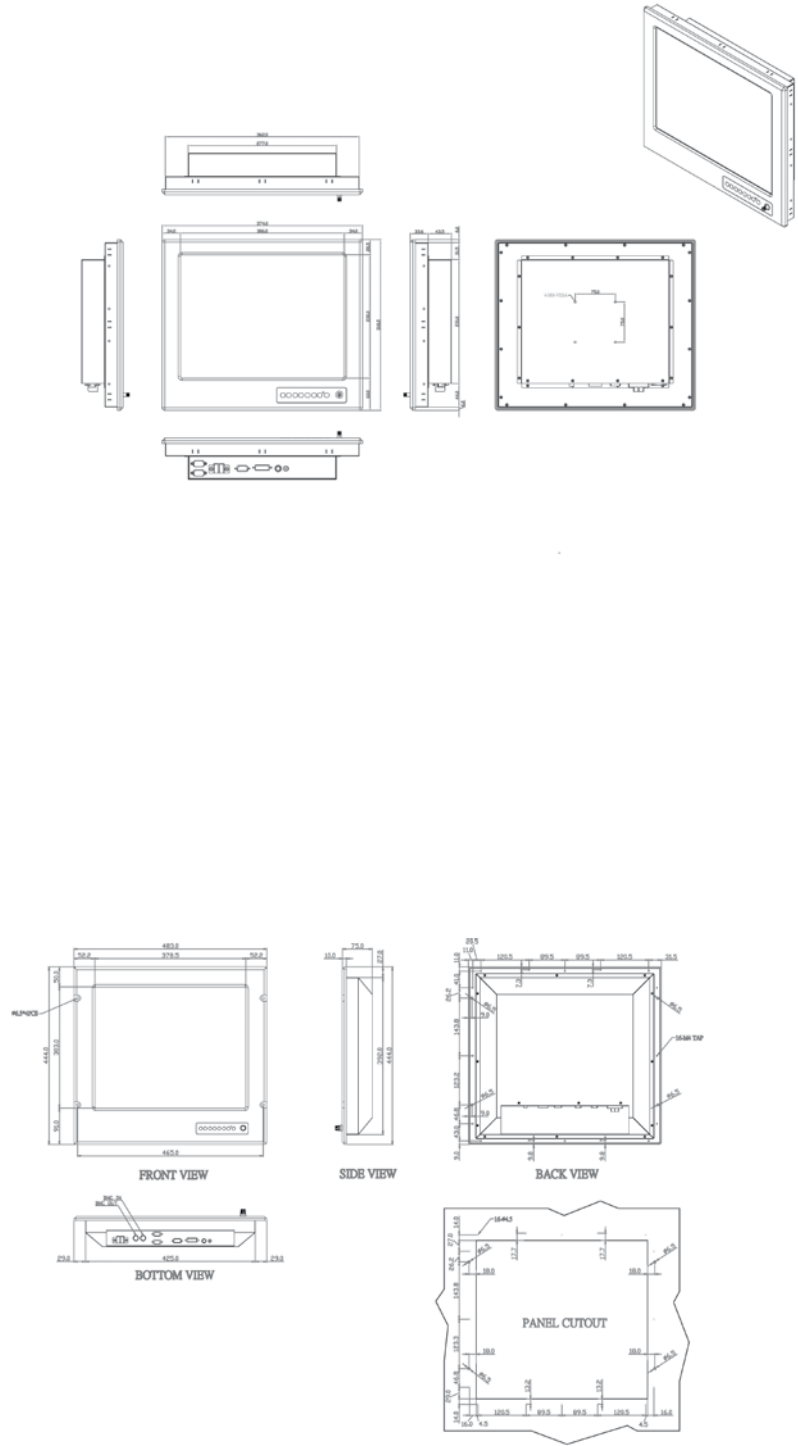
	HV 100	HV 125	HV 150	HV 260	HV 280
					
Detector					
Detector Material	384x288 / 160x120 Asi Microbolometer			384x288 Asi Microbolometer	
Spectral Range	8-14 μm			8-14 μm	
Lens	50 mm / F1.1, 25 mm / F1.0			80 mm / F1.0, 61 mm / F0.8	
Field of View (FOV)	9.15x6.87° (50 mm), 18.18x13.69° (25 mm)			9.6x7.2° (80 mm), 6.87x5.15° (61 mm)	
Image Storage					
Type	Removable w/4GB SD			Built in on board w/4 GB SD	
File Format	BMP			BMP	
Video Recording	AVI Format			AVI Format	
Image Presentation					
Display	LCD colour, 320x240 pixels			OLED view finer, 852x600 pixels	
Video Output	50 Hz PAL / NTSC			50 Hz PAL / NTSC	
Focus Zoom	Manual, 2x electronic, manual focus			Manual, 2x electronic, motorized focus	
Adjust	Auto / Manual brightness and contrast			Auto / Manual brightness and contrast	
Polarity	White Hot / Black Hot Switch			White Hot / Black Hot Switch	
Standby Mode	√			√	
Still Image Capture and Video	√			√	
Power System					
External DC Adapter	110-240 VAC / 9 VDC			110-240 VAC / 9 VDC	
Rechargeable Li-ion Camcorder Battery	—			DC 7.2 VDC 1.75 AH	
Rechargeable Battery Dock	√			√	
Power Dissipation	< 5 W at 25°C			< 5 W at 25°C	
Battery Type	4AA or 4.8 VDC / Li or alkaline			Li-Ion battery	
Battery Operating Time	> 2 hours continuous			> 2.5 hours continuous	
Interface	RS-232, USB 2.0			RS-232, USB 2.0	
Analog Video Output	√			√	
Environmental					
Operating Temperature	-10°C to +50°C			-20°C to +60°C	
Storage Temperature	-30°C to +70°C			-30°C to +70°C	
Water and Shock Resistance	Shockproof 1 m drop			Waterproof 1m submersion, shockproof 1m drop	
Colour	dark grey, orange			dark grey, orange	
Weight	0.6 kg / 1.3 lbs, 0.76 kg / 1.7 lbs			1.2 kg / 2.6 lbs	
Dimensions	160x110x70 mm / 6.3x4.3x2.8 in			195x90x160 mm / 7.7x3.5x6.3 in	
Compliance	CE, RoHS			CE, RoHS	







	CT10, CT12
	
TFT Specifications	
Resolution	1024x768
Brightness	500 Nits
Touch	4 Wire Resistive
System Specifications	
Processor	Intel® Core 2 Duo 1.06 GHz
BIOS	AMI System BIOS
System Chipset	Intel® 945 GSE Chipset, ICH7
System Memory	1x SODIMM, Max. 2 GB DDR2 400 / 533, Default 512 GB
LAN Controller	Realtek RTL8111B GigaLAN Controller, Single Gigabit LAN
Storage Options	2.5 in 80 GB SATA HDD, Industrial CF Card, 2.5 in Automobile HDD, 2.5 in Solid State Disk (SSD)
Audio	Audio Out for Headset, Micro-in for Microphone Jack
Expansion Slot	PCI Express Card
Wireless Communications	
WLAN	802.11 b/g
Bluetooth	Internal by USB Module
WWAN (Optional)	PCI Express Card: GSM/GPRS, CDMA, UMTS, EDGE
GPS (Optional)	PCI Express Card: GPS Solution
I/O Connectors	
Left I/O Port	1x RJ-45 10/100/1000 Mps LAN, 2x USB 2.0, 1x Audio Out, Micro-in Jack, 1x Power Input Jack
Right I/O Port	1x COM, 1x VGA, 1x USB 2.0
Upper I/O Port	1x PCI Express Slot for Expansion, 1x USB Slot for Expansion
Downside Docking	1x Docking Connector for Expansion, 4x USB, Docking Stand Power Input
Power Specifications	
Power Input	12 VDC
Battery	Li-Ion Battery 4800 mA, 11.1V
Battery Operating Time	2.5 Hours
Charging Time	2.5 Hours
Adapter	110 / 240 VAC, 50 - 60 Hz
Mechanical and Environmental	
Dimensions	311x232x45 mm
Weight	2.2 kg
Operating Temperature	-20°C to +60°C
Operating Humidity	10-90% non-condensing
IP Proof	IP54
Mounting	VESA Mount, Universal Mount
Shock Resistance	Mil-Std-810F M516.5
Vibration Resistance	Mil-Std-810F M514.5
Drop Resistance	Mil-Std-810F M516.5, 4 ft Free Drop to Concrete
Compliance	CE, FCC Class B, UL





# WORLDWIDE SERVICE

*Comprehensive service, training and support programs for global coverage!*

### Worldwide technical servicing support network

As part of our commitment to service, ComNav provides worldwide customer support through our extensive global network, 24 hours a day, 7 days a week! With expert knowledge of our entire product line and a thorough understanding of the marine industry, our engineers and customer service representatives are highly trained to provide boat operators with accurate, on-the-spot troubleshooting. If questions are not being answered by conventional means, any member of the ComNav community is welcome to contact the factory for rapid response to client demands. We strive to ensure that each customer receives a totally satisfactory service experience.

# QUALITY ASSURANCE

*Reliability rest assured...*

### Quality exceeds International safety standards

The International Maritime Organization (IMO) is a specialized agency of the United Nations that is responsible for measures to improve the safety and security of international shipping, and help prevent marine pollution from ships. The first maritime treaty dates back to the 19th century and was established to fulfill a need for regulated international shipping standards. While the Titanic disaster of 1912 spawned the first international Safety of Life at Sea (SOLAS) convention. To this day, SOLAS is still a highly recognized treaty alongside IMO as the reputable agency addressing maritime safety, which ComNav strictly adheres to.

### Quality testing

Since marine electronic equipment is often used in particularly extreme sea environments, ComNav products undergo rigorous and comprehensive performance testing such as temperature, humidity, salt spray, wind resistance, radio frequency interference, electrical noise immunity, severe shock and vibration as well as waterproof integrity and much more. With ComNav, boaters gain the confidence to safely navigate through any sea conditions. In addition, ComNav’s worldwide support and service network means we’ve got your back regardless of your location.

# SUSTAINABILITY

*We believe that protecting our resources... water, air and forests... is critically important. Our commitment is to issue the smallest footprint possible and to help our customers do the same, so we look for ways to reduce, reuse and recycle. We recognize that policies caring for the environment are shared and respected by all humanity.*

### Navigating greener

ComNav recognizes its responsibility as a global citizen and strives to positively contribute to society by making an asserted effort to reduce our environmental impact. We are committed to designing and manufacturing environmentally friendly products, with a focus on using recycled materials. Our business embraces environmentally responsible philosophies to develop products that save energy and fuel, and conserve resources.

### Decreasing our carbon footprint

ComNav adheres to environmental laws that prevent land, air and water pollution, and sources environmentally friendly materials that contain no harmful substances. We follow a strict recycling program in order to reduce and control industrial waste. Also, in an effort to reduce the effects of global warming, we are making improved efforts to decrease CO2 emissions by using energy more efficiently.

### Restrictions of Hazardous Substances Directive (RoHS)

ComNav avoids using heavy metals and hazardous substances, such as lead, mercury, cadmium and some flame retardants, in our production process. We also require our manufacturing alliance partners to share the same values by encompassing similar policies and cultures. Furthermore, to help solve the problem related to massive amounts of toxic e-waste, we adhere to the RoHS directive – a ruling that is closely linked to the Waste Electrical and Electronic Equipment Directive (WEEE) and sets targets for the collection, recycling and recovery of electrical goods.

