



2020

MARINE  
RV  
SPECIALTY VEHICLE  
EMERGENCY VEHICLE



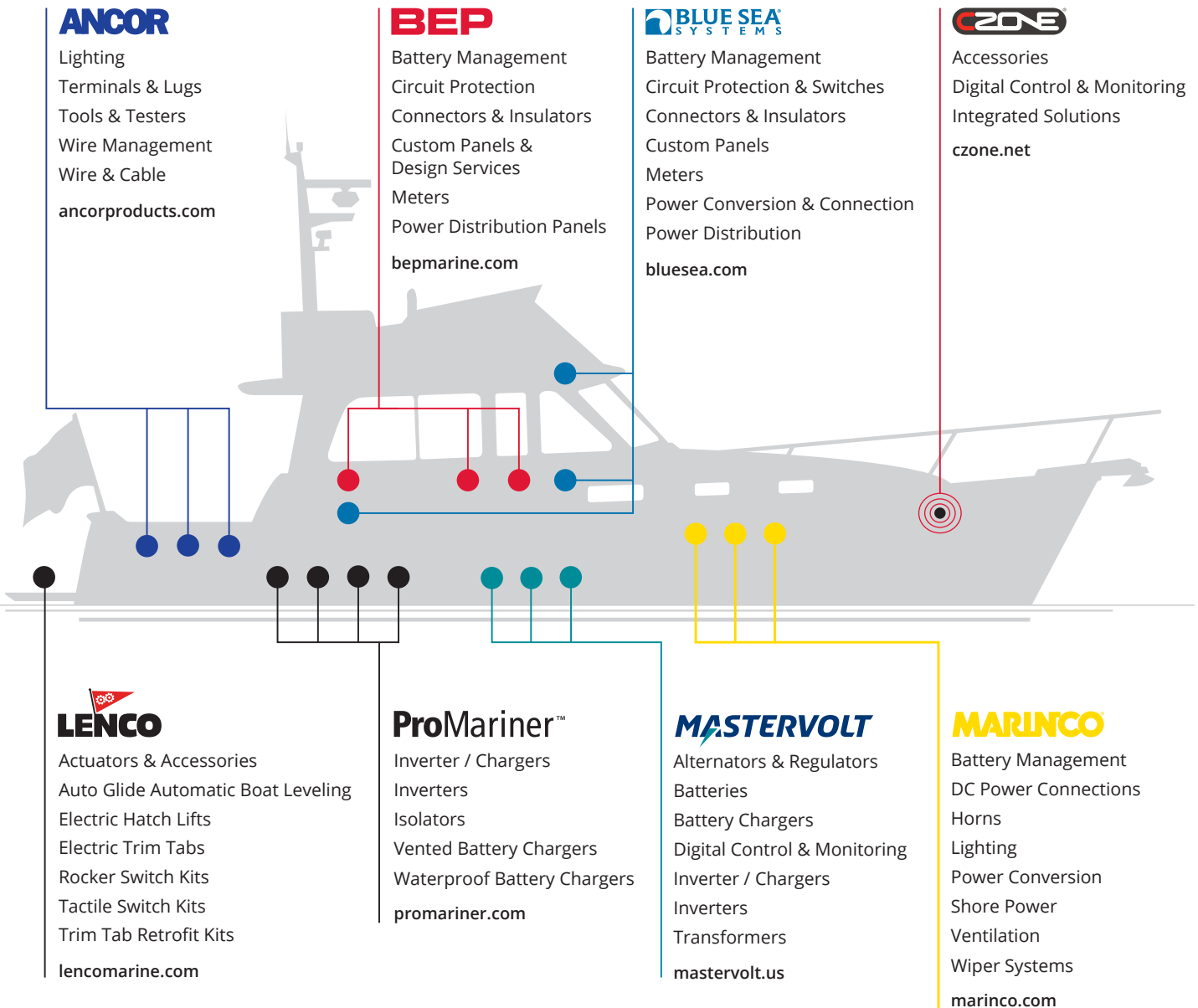
Accessories

Digital Control & Monitoring

Integrated Solutions

For decades Ancor, BEP, Blue Sea Systems, CZone, Lenco, Marincos, Mastervolt and ProMariner have worked independently to provide innovative electrical products. Now the eight companies are working together to offer comprehensive electrical solutions for marine and mobile applications.

### Providing more than products. Providing Solutions.





# What is CZone:

## Founder's Vision

For over 10 years industry leading digital control and monitoring technology from CZone has revolutionized the control and management of electrical systems in the recreational and light commercial vessel industry, and become established in recreational, specialty and emergency vehicle markets across the globe. CZone provides complete control and monitoring of all electrical circuits through dedicated touch screen interfaces, integrated marine navigation displays, wirelessly via iPad or key fob remote, or remotely via telematics integration.



## Simplicity

CZone simplifies your boat or vehicle's onboard electrical system making it easier and more enjoyable.



## Innovation

CZone offers system-wide functionality of your onboard systems onto a single screen or wireless device, while offering industry leading integration with suppliers from marine navigation displays, power storage and generation, and appliances like air-conditioning and more.

## Reliability

CZone has proven durability, with over 10 years of installations in harsh marine environments through over 200 dedicated boat builders and technical installers.

## Global Service & Support

CZone has a broad network of technical dealers and distributors to support the installation and servicing of CZone systems across the globe. Regionally located logistics and technical competency centers ensure the global network is well supported.



# 2019-2020 **NEW** Products



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## **CZONE** Contact 6 PLUS

Utilizing proven CZone digital switching technology the Contact 6 PLUS is a robust and affordable digital switching solution. Featuring 6x 15A solid state ignition protected fused outputs with circuit bypass for system redundancy. The Contact 6 PLUS can be networked into an existing CZone system or installed stand-alone with the CZone Waterproof Keypads or compatible multi-function displays.

Part # 80-911-0160-00



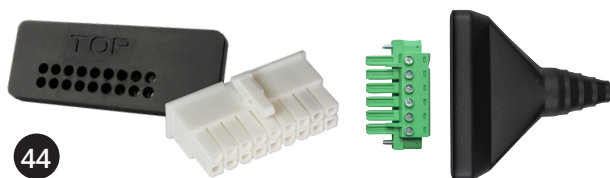
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## **CZONE** 2 & 3 Module Smart Harnesses

CZone utilizes the industry standard NMEA2000 Network for its communication protocol. The new CZone Smart Harness replaces the need for a complete network backbone in a small system, meaning a robust, simpler and more cost-effective installation.

Part # 80-911-0171-00 2 module

Part # 80-911-0172-00 3 module



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## Accessories for Contact 6, Contact 6 PLUS

Cable Glands, Seal Kits and Connector Blocks are available for Contact 6 and Contact 6 PLUS as spares.

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## NMEA 2000 Power Isolator

Used for isolating power between two independent NMEA 2000 networks. Reduce battery current draw by powering one bus off while the other remains operational, or can be used to assist with voltage drop issues on long networks.

Part # 80-911-0137-00



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## **CZONE** Control 1 Interface

The Control 1 combines multiple input and output devices in to a single module, minimizing installation, interconnections and footprint. The Control 1 incorporates many of the core features and benefits of the fully featured Combination Output Interface (COI), but has been re-engineered to offer improved cost-per-channel value. The Control 1 features the same rugged design as the fully featured COI with IPX5 water ingress protection and complete mechanical fuse and bypass on all circuits as required by ABYC/CE. Industry standard Deutsch connectors provide "plug and play" installation.

Part # 80-911-0122-00



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## **CZONE** Waterproof Keypads

The CZone Waterproof Keypad range features dimmable RGB circuit backlighting in a robust IPX7 waterproof enclosure and is available in portrait and landscape orientations.

Part # 80-911-0163-00 portrait

Part # 80-911-0162-00 landscape



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## **CZONE** Contact 6

The Contact 6 is a digital control module that can be networked with other CZone products or a stand alone. The Contact 6 has six independent channels that are positively or negatively switched and is ideal for smaller marine applications or recreational or specialty vehicles.

Part # 80-911-0139-00

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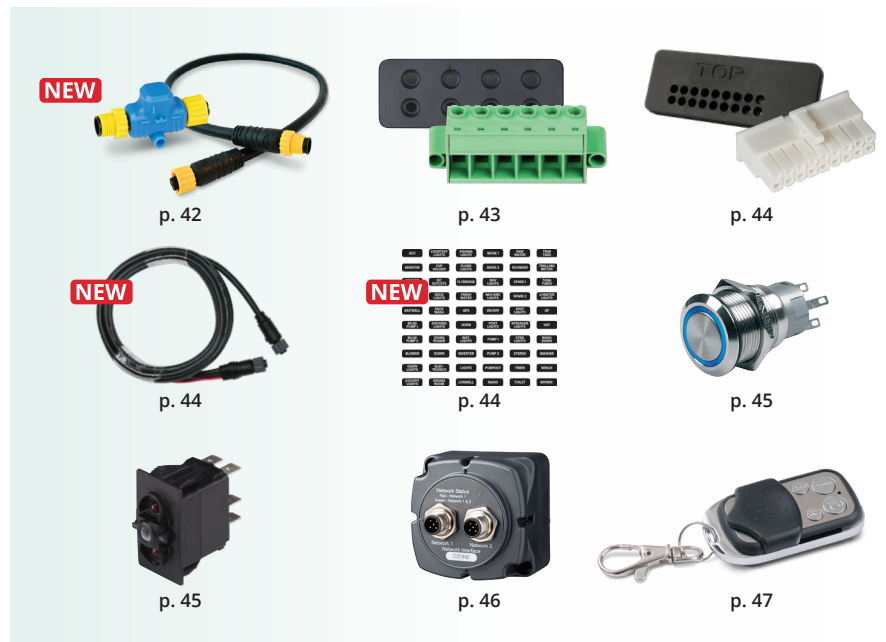
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# DIGITAL CONTROL & MONITORING

## CZone® Displays



CZone displays are designed with both the manufacturer and end-user in mind. The easy-to-use display screens put the control of all components directly at your fingertips.

## CZone® Wireless Interface



The CZone wireless interface allows your iPad® to interface with an onboard digital control and monitoring system for full monitoring and control of the electrical equipment via a clear and intuitive display.

## CZone® Control 1 Interface



The Control 1 combines multiple input and output devices into a single rugged IPX5 module featuring industry leading CZone core functionality and complete mechanical fuse and bypass on each circuit.



# DIGITAL CONTROL & MONITORING

## CZone® Combination Output Interface (COI)

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Digital control and monitoring systems just got easier to install with the new CZone Combination Output Interface (COI). This one box replaces up to five separate modules, with industry-standard Deutsch connectors and IPx5 water resistance.

## CZone® DC Interfaces

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NEW



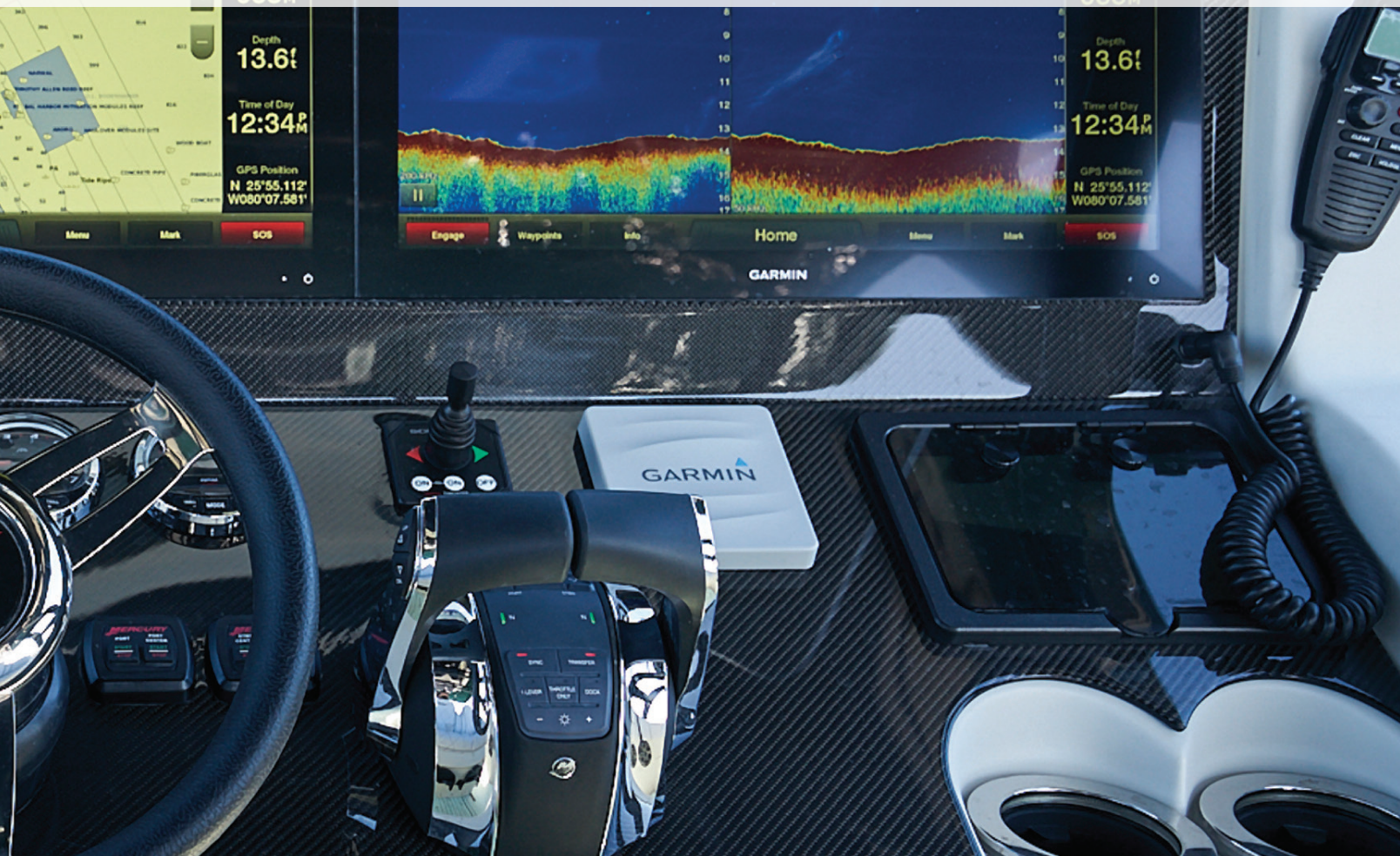
CZone DC Interfaces provide an intelligent replacement for traditional circuit breaker panels as well as interfacing traditional mechanical switches & sensors with the CZone network.

## CZone® AC Interfaces

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CZone AC Interfaces handle the complex management of multiple AC supplies to ensure AC circuits are powered from the appropriate source, along with providing control & monitoring of all circuits from the same intuitive CZone screen.





## Digital Control and Monitoring

CZone digital control and monitoring simplifies installation of electrical systems through the replacement of complicated, cumbersome traditional wiring. CZone is perfect for marine and mobile applications and replaces switch and fuse panels with networked digital interfaces providing ultimate control of onboard electrical systems.

With one touch, CZone's intelligent management simplifies operation by combining multiple circuits through mode selection and offers effortless monitoring oversight of key systems and components while retaining advanced control of specific circuits and functions.

CZone can take care of all the little things, leaving more time for the user to focus on what they value. Whether you are preparing the boat for the evening's entertaining, hitting the open road away from stable power, or focusing on getting the job done, let CZone do the thinking.

## Marine, Recreational, Specialty or Emergency Vehicle

**CZone delivers purpose built functionality for the marine, recreational vehicle, and specialty or emergency vehicle markets.**

### Marine

CZone has an extensive 10-year history of providing innovative digital control and monitoring to some of the leading premium boat builders across the globe. Our partners understand the benefits of CZone for their systems with digital control and monitoring swiftly becoming a standard for any sophisticated vessel.



### Recreational Vehicle

CZone offers the industry leading solution for complete recreational vehicle switching for your smart vehicle. Larger recreational vehicles host complex onboard electrical systems to provide the user with functionality from broad integration for control and monitoring of multiple vehicle systems, to automation of key functions such as power management and storage, and to provide the user with a simple clean and friendly interface.



### Specialty & Emergency Vehicle

Vehicle digital control and monitoring automation offers operating efficiency and cost savings. Speedup deployment times with mode selection. Ensure uptime through complete power integration management. Maintain simple, straightforward operation for personnel with easier training and operating instructions, or improve maintenance and configuration standardization easily across a fleet.



## Modes

Modes offer a predefined system state at a single touch. Modes will turn on or off specified circuits based on the user's preference and the mode of operation required.

Modes can introduce logic to handle functions based specifically for that mode of operation, whether it be integrated components like generator auto-start, or varied lighting configurations. If it needs power, modes can take care of it in a single function.

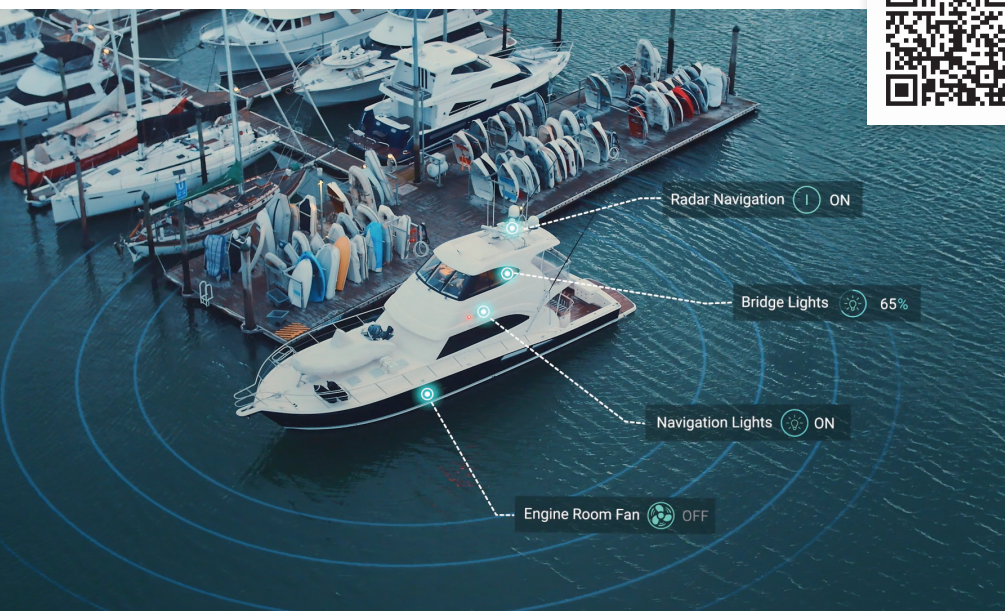


### Marine Modes

Boat manufacturers can offer a range of predefined modes for the applications and systems built into their vessels. Custom modes can however be programmed to achieve any desired state for the system.

Larger vessel systems can be extensive and complex, making it a challenge for many users who simply want to focus on enjoying their time on the water.

Modes can ensure critical systems, from bilge pumps to power supply systems, remain operational in the background no matter what the user is doing onboard.

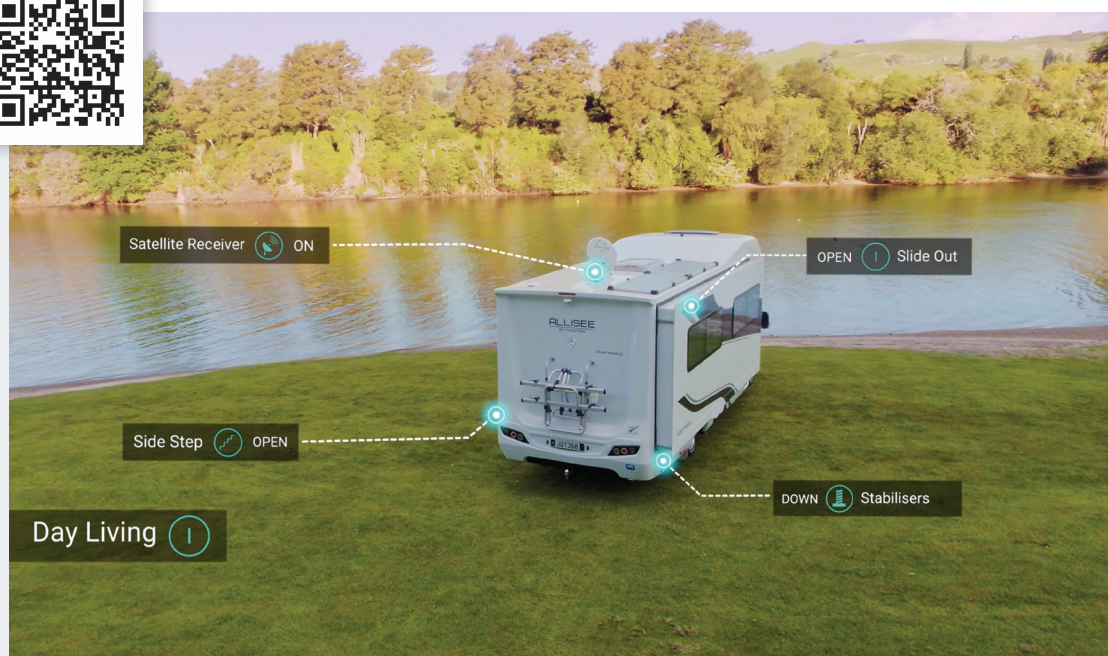


### Recreational Vehicle Modes

Recreational vehicle manufacturers can offer a range of predefined modes for the simple activation of the vehicle. Custom modes can however be programmed to achieve any desired state for the system.

Control each system in the circuit in a single press from a CZone touch screen interface, digital switch, or wirelessly via key fob, connected iPad or remotely through telematics.

Any system or circuit can be controlled independently while still in a defined mode.



## Complete Control

CZone offers leading system control of onboard systems, from modes selection that transforms the entire system at a single touch, wirelessly via iPad or key fob, or remotely via satellite or data networks. Full direct control is accessible using intuitive touch screen interfaces or through integrated marine Chartplotter & Fishfinder displays, or programmable digital switches for individual or group functions.

**Directly Control** your system through programmed digital switches or get complete access to vessel systems via a CZone touch screen interface.

Digital switches can be programmed to activate any range of desired functions. From entire system mode selections, individual circuits, time delayed circuits or multiple circuits controlled in sequence.

Access every circuit and maintain complete control, from ON/OFF to dimming level on certain circuits. Controllable circuits are grouped and filtered for easy access, from current type to function or system type. Users can override any mode state for that circuit directly if required.



Enjoy **wireless control** of your boat or vehicles system using iPad tablet or key fob remote control. Wireless capability is built-in to the CZone Touch 5 (see page 19), or available using the wireless interface module (see page 23). Telematics monitoring and control functionality is dependant on the provider (see page 21).

## Monitor

13.78 V	ALL	PORT START BATTERY
13.75 V	DC MONITORING	
13.85 V	AC MONITORING	
13.81 V	TANKS	VOLTAGE 13.78v
		VOLTAGE MIN 13.70v
		VOLTAGE MAX 13.89v

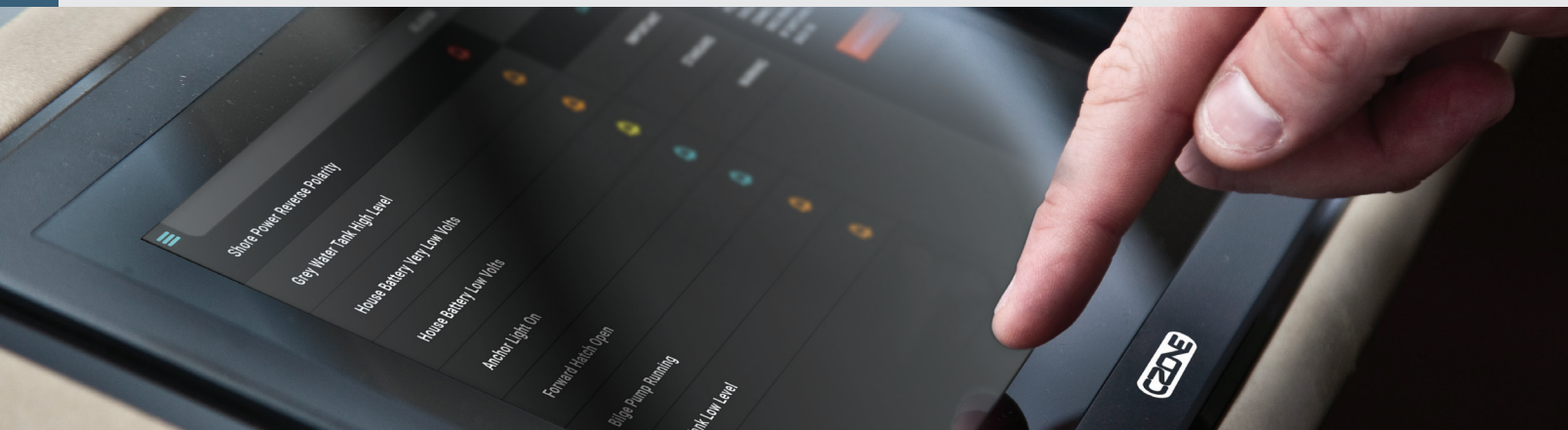
Monitor house battery state of charge, voltage and current usage. See how long your batteries will last without the need to supply the system with charge.

## Control

0.8 A	ALL	CABIN COURTESY LIGHTS
1.5 A	IN OPERATION	
13.7 A	PUMPS	
6.0 A	LIGHTING	VOLTAGE 13.74V
3.0 A	POWER	CURRENT 0.8A
0.5 A	NAVIGATION	ON COUNT 1
		ON TIME 2m
		FAULTS NONE

Control lighting circuits individually, groups of circuits or complete mode selection. Set the mood or environment to match what you're doing.





## Monitoring & System Alarms

CZone digital control and monitoring offers peace of mind by consolidating system information and presenting alarms when things aren't right. Monitor tank level senders, gas or temperature sensors, low power source voltage or reversed polarity. CZone's advanced monitoring ability means no irregularity in the system goes by without you knowing about it. Keep alerted to major system events with onboard alarm notifications.



### Pop-up Alarms

Alerts will pop-up with key details about the alarm no matter where in the CZone menu you are. Alerts can be Acknowledged to silence them, while a full list of active alarms will remain in the Alarms History panel. Critical alarms, even if acknowledged, will reappear after 10 minutes and remain persistent until the issue has been resolved.

### Alarm Types & Severity



**Critical** alarms are where immediate action is necessary to avoid damage and/or failure of a system. With a pop-up dialogue and audible tone it's hard to miss any critical alert. The alarm will return in 10 minutes after acknowledgment, until the fault is remedied.



**Important** alarms identify something that needs investigation before trying to operate it again. This alarm will give you an audible tone and pop-up dialogue on screen. Once acknowledged it'll remain active in the CZone's active alarms page until the fault is resolved.



**Standard** level alarms identify an issue that may or may soon cause an issue for operation. Once acknowledged the pop-up dialogue will disappear.



**Warning:** Low level warnings indicate a minor issue or advisory about the system. This may or may not impact the system with any significance. Once acknowledged the pop-up dialogue will disappear.

### Load Shedding & Trigger Functions



**Trigger functions** are where CZone takes an action when a certain set of criteria is met. Trigger functions are highly configurable and can be set to handle simple or complex actions.



**Load shedding** is used when power stores become low to attempt to extend the endurance of the system before recharge or complete shutdown. CZone will turn off non-essential circuits to reduce the load draw and increase how long the system will have sufficient power.

LIGHTING	VOLTAGE	13.74V
	CURRENT	0.8A
POWER	ON COUNT	1
NAVIGATION	ON TIME	2m
	FAULTS	NONE

### Cycle Counts & Run Times

Monitor the number of times a circuit has been triggered and the circuit run time. Understand if a bilge pump is running too frequently and if there may be a potential water leak in the vessel which needs to be investigated.

## Intuitive Navigation

### Control & Monitoring Pages

#### List Panel

The control & monitoring pages list each circuit available in that category. Each circuit indicates key detail - like status on-or-off or level of dim. Current draw amperage for each active circuit is shown in real-time.

CONTROL			
Anchor Light		3.9 A	ALL
Cabin Courtesy Lights		OFF	IN OPERATION
Cabin Lights		OFF	PUMPS
Cockpit Courtesy Lights		OFF	LIGHTING
Cockpit Light		OFF	POWER
Galley Lights		OFF	NAVIGATION
Head Light		OFF	FANS/VENTILATION
Navigation Lights		OFF	HOUSE/HABITAT
Night Lights		OFF	VESSEL MANAGEMENT
Saloon Lights Port		OFF	

#### Control & Detailed Monitoring Panel

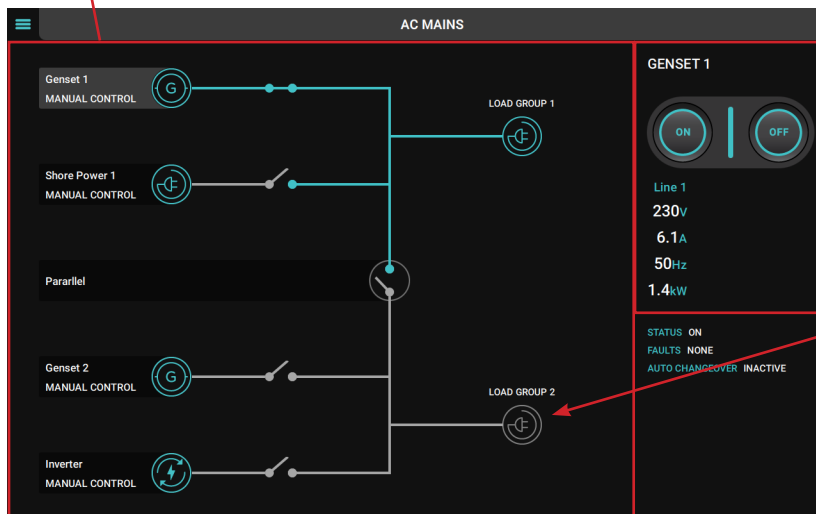
The control and data panel shows key controls and details relating to that circuit. Name, status and other detailed information like circuit run-time or the numbers of times it has run can all be seen.

#### Active Filter Panel

The filter panel allows the user to control which types of circuits are shown in the controls list panel, from active circuits to lighting or appliance only circuits.

## AC Mains Page

The AC Mains page illustrates the flow and connection of AC power sources in the system.

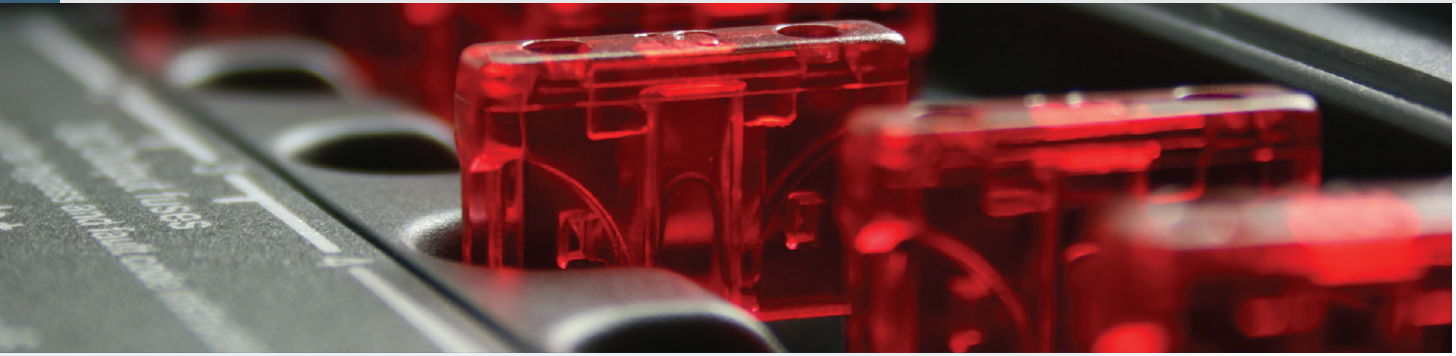


#### Control Panel

The control panel allows AC supply source to be selected manually

#### Icons

Source icons indicate if power is available, while the circuit diagram clearly shows the direction of flow between components.

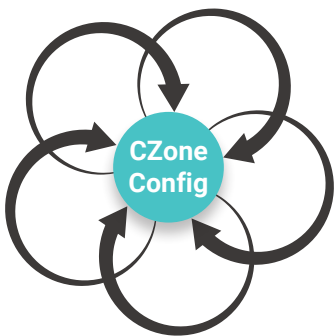
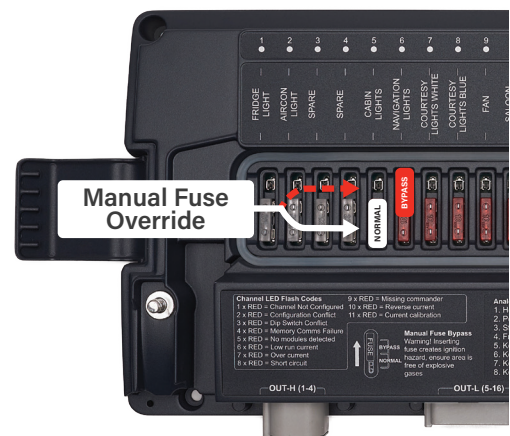


## Reliability

All CZone modules are designed for harsh marine environments. It operates on a NMEA 2000 network making CZone incredibly durable and reliable. Integrated circuit over-limit protection prolongs the life of your electrical system. Manual fuse overrides are incorporated into the CZone modules, so if there is a power failure, critical systems continue to function.

### Manual Fuse Override

CZone offers built-in redundancy from the digital control and monitoring of system circuits. By changing the position of the fitted blade fuse on any of the CZone Output Interface (OI), Motor Output Interface (MOI) or Combination Output Interface (COI) Modules, the individual circuit can be taken in or out of the CZone system.



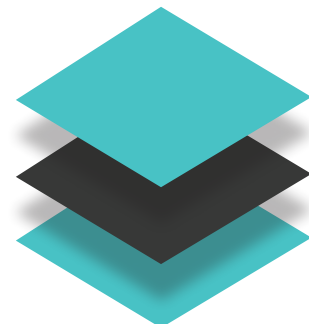
### Distributed Configuration with Plug & Play Module Replacement

CZone's unique design means the system's configuration and settings are not stored in any single networked device. The Config is distributed to each CZone module meaning that any single or group of modules that becomes damaged or develops a fault will not affect the rest of the system.

Module replacement is simple. After first correctly labelling, placing the required fuses and setting the required dip-switch to match the old module, the connecting of the new CZone module will automatically claim the existing config from the system and you're up and running.

### Multiple Levels of Circuit Protection

CZone has been engineered to be physically durable and offers leading protection to the various systems and circuits within the vessel or vehicles systems. Initial protection utilises system alarms and trigger functions to offer early detection and resolution to troubles onboard. Quick-blow fusing uses CZone's operating system to detect fault level current or voltage changes spikes and will automatically isolate the circuit digitally. The final layer of defence uses traditional mechanical fuses to physically trigger and isolate a circuit to protect the system components from damage.





### Industry Standard NMEA 2000

CZone is NMEA 2000 certified and uses standard micro cables and connectors. This also allows a single network backbone to be installed for multiple systems (CZone and other NMEA 2000 devices). Additionally, CZone can share certain monitoring functions with other NMEA 2000 compliant screens. The CZone MasterBus Bridge Interface expands the system integration to a whole new level. No other company can bring digital control and monitoring, power electronics and marine navigation systems together into one interactive, seamless system.

### Installation

Builders recognize an immediate benefit with reductions in cable usage, harness weights and installation times. CZone integrates many stand-alone components into one intuitive system. Wiring is dramatically simplified as CZone is designed to remove complex switching clusters and wiring runs. Modules can easily be added into the system to best suit the OEM and end-users' needs.



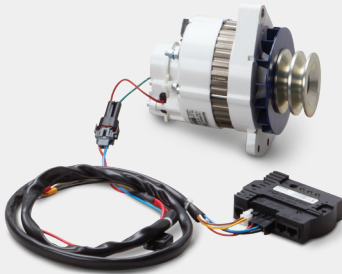
## MASTERVOLT

### Power System Integration

CZone's integration with Mastervolt offers a market leading solution for complete power management from supply, storage and conversion.

### Manage

Mastervolt offers the highest quality components which have the ability to communicate in a comprehensive, network system. A range of monitors and the ability to integrate with name brand electronics, provides information about the electrical system when, where and how the customer desires.



### Generate

Whether you are off on a worldwide journey or a few days on the road, being independent from grid connected power requires alternative energy sources. Ultimately, an energy source that generates its own power will be required. Mastervolt offers a wide range of power solutions that generate energy from (solar) charge regulators to high-output alternators.



### Store

Mastervolt provides autonomous power for vehicles, boats, houses and furniture that may not be connected to the grid for long periods of time. Powerful, robustly constructed batteries are the key. Mastervolt offers several battery technologies, all designed for optimal performance, reliability and longevity in harsh environments.



### Convert

Mastervolt's power conversion products offer cutting-edge technology, quality and reliability. Whether using a microwave, LCD TV, coffee maker, cell phone charger, entertainment system or more, Mastervolt's electrical products power the comforts of home.

## Partnerships

### Volvo Partnership

Volvo Ocean Race competitors compete in some of the harshest environments our oceans have to offer. These grueling conditions test not only the crew, but the gear they use to keep them alive and get them to the finish line. CZone components are designed to meet these challenges with proven reliability for generations of competitors.

Through a partnership with the **Volvo Ocean Yacht Race** since 2014, CZone has illustrated a capability to control and monitor complex navigation, power management, communication and vessel systems in the testing marine environment.



*"I've spent a lot of time working with Mastervolt and CZone. I'm really impressed how solid it is, how stable it is. We never have any issues, any breakdowns, any failures, it just works. It doesn't matter how we treat it, we treat it quite rough... it does the job."*

**Nicolai Sehested, boat captain of Team AkzoNobel, Volvo Ocean Race**

### The New Standard for Marine Electrical Systems

Boat builders around the world are embracing the benefits and advantages of CZone: simplicity, innovation and reliability. CZone's simple operation adds value to their customers' experience, while simple design configuration tools ensure their staff can become their own CZone experts. Innovation through the distributed intelligence of digital wiring providing future flexibility in configuration changes and immediate weight savings to installation when compared to traditional wiring. With long standing partnerships with key boat builders across the globe spanning more than 10 years, CZone digital control and monitoring systems have proven reliability that meets the stringent standards of reputable boat builders.



*"CZone provides Riviera owners with reliable onboard power systems. The integrated system gives our owners more functionality with fewer components, straight forward and practical design makes installation simple. We have a partner that understands our requirements and provides Riviera the quality and reliability our owners demand."*

**Greig Payne, Electrical Manager, Riviera Yachts, Australia**



## Application Engineering & Integrated Solutions

### Design & Build

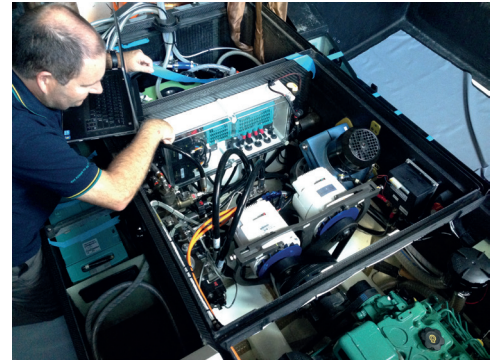
CZone system design and build is straight forward and supported from conception to commissioning. Using either our regional application engineers or comprehensive integrated solutions business, we can ensure customers receive necessary support right the way through the journey to completion.

### Application Engineers

Application engineers are our team of expert staff who support our customers through the system design, configuration and commissioning of their CZone systems. Application engineers ensure customers are trained and supported in the ongoing management of their CZone Systems.

### Integrated Solutions

Integrated solutions is a comprehensive offering that extends beyond the initial design and commissioning of the CZone system. Integrated solutions is an end-to-end service. Starting with the initial system design, through production and installation of wiring harnesses, breaker and switchboard panels, and then the final configuration & commissioning. Integrated solutions will remain onhand to offer after sales Support into the future.



**System Design ⇨ Production ⇨ Configuration & Commissioning ⇨ Support**

## Global Technical Service & Support



### Tier 1 - Global Certified Dealer & Distributor Network

CZone has a broad network of technical dealers and distributors to support the installation and servicing of CZone systems across the globe.



### Tier 2 - Regional Support Teams

Regional application engineering & technical support teams offer comprehensive guidance and backup to our global sales & service network.



### Tier 3 - Engineering & Product Development

Engineering & product development is the last line of defense and supports our regional tier 2 technical service teams.



[CZone.net/distributor-locator](https://czone.net/distributor-locator)



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## CZone® Displays

CZone displays are designed with both the manufacturer and end-user in mind. The easy-to-use display screens put the control of all components directly at your fingertips. Multiple display interfaces can be used in the same system. The scroll and click interface is simple to use in the roughest of seas or bumpiest of roads.

CZone displays are the interface between the CZone network and the user. They offer full control of circuits as well as the ability to view important onboard system information, such as tank levels and power levels (for both AC and DC supplies).

Audible and visual alarms with systems diagnostics are also provided. The displays are extremely intuitive to use with simple controls and a menu structure that is easy to follow. The 'modes of operation' feature allows the control of multiple circuits with the push of a button.



## Touch 10

**Premium touch interface with glass dash styling and low profile mounting**

The generously sized Touch 10 provides excellent viewability and is the premium gateway into your integrated CZone system. Sleek and attractive, this display will complement the interior of any high-end application. But it's not all about looks - with the Touch 10, your CZone system is in good hands.

Capacitive high-bright touch display offers impressive daylight visibility with crisp graphic detail and elegant touch sensitivity. Full control offers an impressive wrap-sheet. Use mode selection to pick the right system configuration for you. Control and monitor key system functions and status, from tank level to current draw.

**80-911-0100-00** Touch 10

**80-911-0102-00** Touch 10 display and retrofit plate kit\*

**80-911-0101-00** Touch 10 retrofit plate kit only\*

\*Required for retrofitting old CZone 10" Touch Screen



Slim  
Side  
Profile



Screen	10.1" LED-backlit Projected Capacitive Touch display with IPS Technology
Aspect Ratio	Widescreen 16:10
Resolution	1280 x 800 pixels
Protection	IP66
Dimensions (WxHxD)	7.72" x 10.83" x 1.61" (196 x 275 x 41 mm)
Weight	4.0 lb / 1.8 kg
Brightness (cd/m2)	500 cd/m2
Input voltage	8-32V
Power consumption	1A @12V, 500mA@24V
Interfaces	NMEA 2000, USB2.0, Ethernet

## Touch 5

**Built-in WiFi allows direct-connection of an iPad for wireless control and monitoring of the system**

The compact Touch 5 is small but mighty, offering a powerful touch screen interface for CZone's powerful digital control and monitoring. With a compact sleek design, the Touch 5 complements nearly any vessel dash or vehicle space.

Built-in WiFi connectivity brings your CZone system into the wireless dimension, allowing full control of system functions—from mode selection, system monitoring and individual circuit control—straight to your fingertips, no matter where onboard you are.

**80-911-0124-00** Touch 5

**80-911-0135-00** Touch 5 retrofit plate 12V kit\*

**80-911-0136-00** Touch 5 retrofit plate 24V kit\*\*

\*Required for retrofitting CZone 3.5" Display Interface.

\*\*Required for retrofitting CZone 3.5" Display Interface. Supplied with 3A 24/12V Converter.

Screen	5" LED-backlit Projected Capacitive Widescreen Touch
Resolution	800 x 480 pixels
Protection	IPX7
Dimensions (WxHxD)	5.98" x 4.72" x 2.28" (152 x 120 x 57.9 mm)
Brightness (cd/m2)	1200 cd/m2
Input voltage	12VDC
Power consumption	900mA @ 13.5v
Interfaces	NMEA 2000, Micro SD



- Easy to use touch interface
- Glass dash styling
- Super bright widescreen display
- Low profile flush mounting
- Reduced system cost and complexity, combines display and Wireless Interface functionality into one unit
- IPX7 water ingress protection
- Built-in WiFi connectivity
- Micro SD card slot
- NMEA 2000 compatible

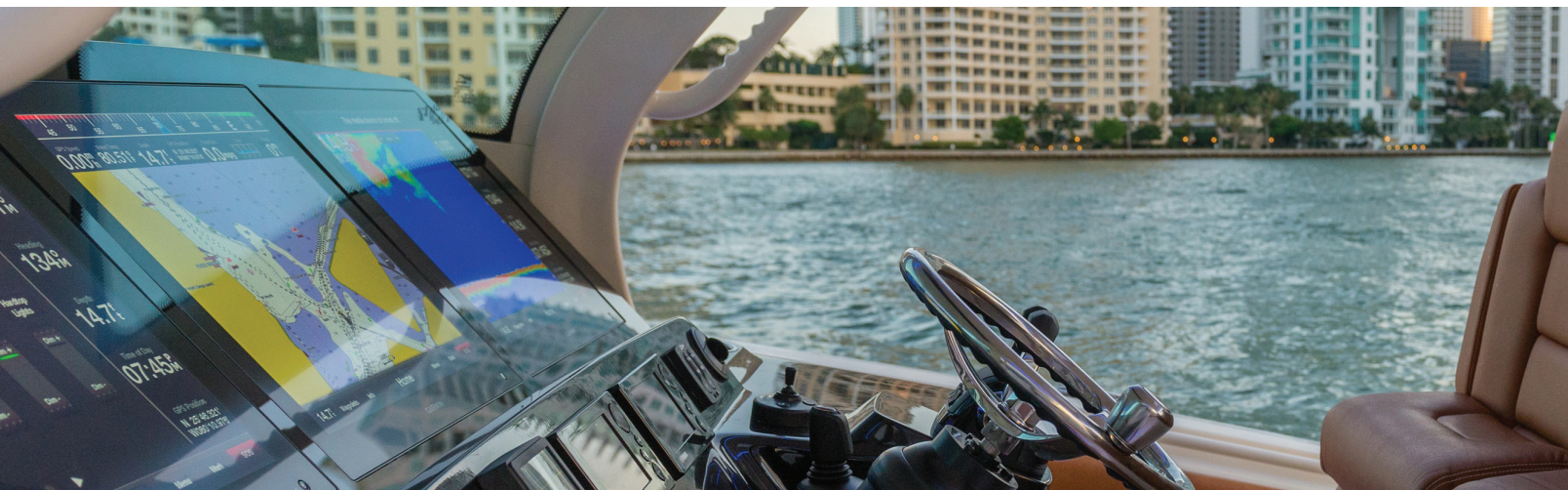


## Marine Electronics Integration

CZone has partnered with leading electronics manufacturers to deliver full function mode selection and configuration, individual circuit control and system monitoring centrally from your dash. CZone digital control and monitoring is available with industry leading manufacturers Simrad, Lowrance, B&G, Garmin and Furuno's multi-function Chartplotter/Fishfinder displays and black-box glass-bridge displays, with engine manufacturers Mercury and Volvo's offered compatibility.

Mode select for night navigation or at-anchor, control individual bilge or tuna-tube water pumps, monitor fuel tank levels and battery capacity, and do it right from the in-dash display along side onboard radar, sonar and GPS charting.

Secondary networked displays offer extended mode, circuit control and monitoring from dash to fly-bridge, saloon or sleeping quarters to ensure everything can remain in arms reach.

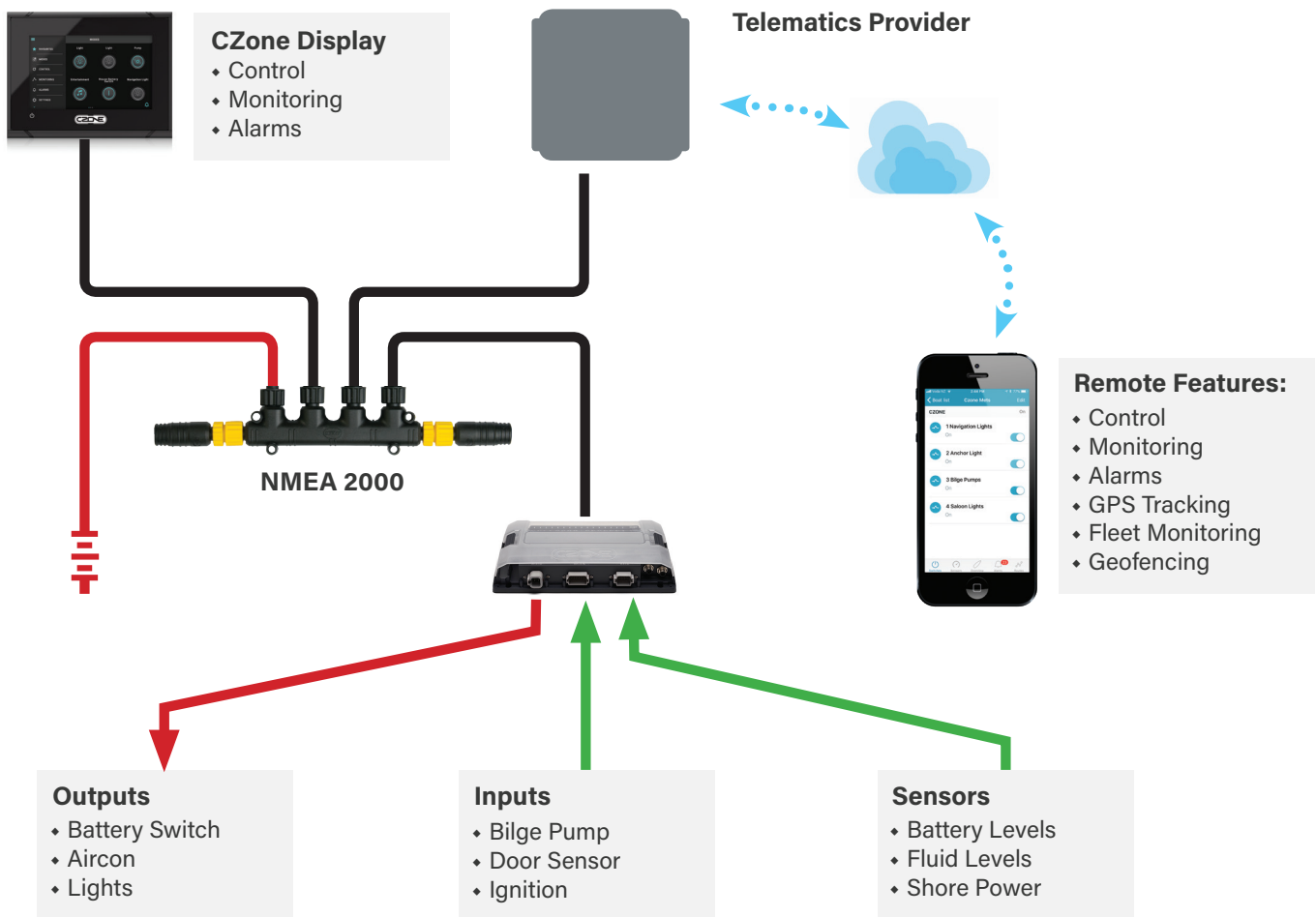
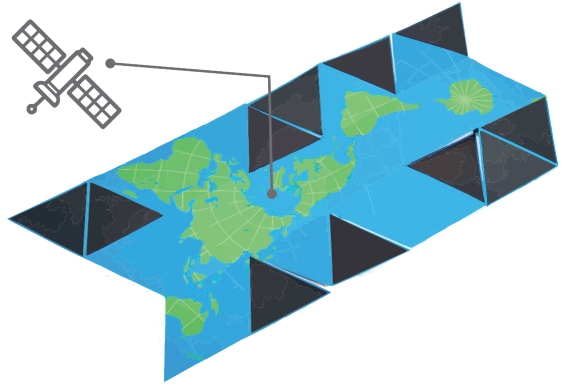
**FURUNO**
**SIMRAD**
**LOWRANCE**
**B&G**
 **MERCURY**
**GARMIN**
**VOLVO  
PENTA**
**Raymarine**


## Telematics

Control and monitor your CZone system remotely using one of our third party telematics partners.

Keep control of your system from the boat or vehicle anywhere you can get data coverage.

Bilge pump alerts, circuit activation, position movements or any other function you may need while away from your system.



Integrated Telematics Providers:



[more at sentinelmarine.net](http://more.at.sentinelmarine.net)

## CZone® Wireless

Enjoy wireless control of your boat or vehicles system using iPad tablet or key fob remote control.

### Wireless Key Fob

Key-less control for your car is now just a way of life. From central locking and boot opener, to engine start and stop.

Industry leading boat and recreational vehicle manufacturers understand the benefits of keyless functionality to ensure their products are innovative and packed features, from controlling start-up and shutdown of house batteries, to illuminating deck lighting for safe easy access in low light conditions.

Control up to 4 different functions or utilise a predefined Mode of operation from each CZone key fob remote.

**Requires analogue input from Combination Output Interface (COI) (page 30) or Signal Interface (SI) (page 35).**



### iPad Wireless

Control any function in your system from the convenience of your iPad tablet in the comfort of the vessel's saloon lounge or RV's fold-out deck chair.

Control lighting circuits individually, groups of circuits or complete Mode selection. Set the mood or environment to match what you're doing.

Monitor house battery state of charge, voltage and current usage. See how much endurance you have until you need to supply the system with charge.

**Requires Wireless Interface (WI) (following page) or Touch 5 with built-in WiFi (page 19).**



## CZone® Wireless Interface

The Wireless Interface (WI) is a digital control and monitoring interface module designed to connect your tablet to the CZone network over WiFi. Handling up to three (3) devices, the WI can offer connectivity of its own internal access point or can interface with other WiFi network systems on your vessel.

**Use the built in Ethernet port for a better connection to an existing network.**

**80-911-0090-00** Wireless Interface

**80-911-0095-00** WI MasterBus Connector  
(required for MasterBus connection)



### Features:

- User-friendly homepage to monitor and control onboard circuits
- Integrated control and monitoring of power products including battery chargers and inverters
- Monitor AC/DC power and batteries
- Monitor tank levels
- Receive visible alarms
- Connect a maximum of three devices simultaneously
- Ability to personalize homepage to display favorite circuits, modes & monitoring
- Customize your layout
- Connects to CZone or MasterBus networks for control and monitoring of systems

### Hardware:

- The Wireless Interface acts as the hub between MasterBus/CZone networks and local WiFi devices

*NOTE: WI MasterBus connector required for MasterBus connection*

- Ethernet connection to connect to other LANs
- USB connection for configuration updates
- Tested to FCC, CE, EMC
- Power cable and aerial included

MasterBus powering	no
Dimensions, hwxwd	4.1" x 7.5" x 2.4" / 105 x 190 x 60 mm
Weight	1.5 lb / 0.685 kg
Protection degree	IP54
Delivered with	power cable, WiFi antenna, USB extension cable, user's manual

## Touch 5 with Built-in Wireless

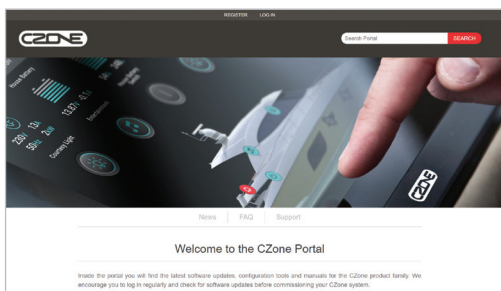
Achieve the WiFi network to network, or network to device connectivity as the Wireless Interface directly from the compact Touch 5 display.

**See page 19 for product details.**



## CZone® Design & Configuration Made Easy

CZone's leading configuration process is relatively easy and all technical customers are offered training so they can design and program CZone systems quickly. Generally generating a configuration and programming a system is both time consuming and complex. Most digital control and monitoring providers required highly trained technicians to program and commission installations, making them time consuming, inflexible and far more costly. Easy configuration with CZone means technical customers can provide this service themselves ensuring the system is setup quickly and the end customer receives industry leading service.



### CZone Configuration Tool

The CZone Configuration Tool software is available to technical CZone customers from the CZone portal at [downloads.czone.net](http://downloads.czone.net)



The CZone Configuration Tool then allows the programmer to upload the new configuration to the connected CZone system via USB Canbus Adapter (below). Each connected system module is updated simultaneously.

CZone configurations are setup, saved, duplicated and customized all from the programmer's PC using the CZone Configuration Tool.

CZone configurations can be programmed repeatedly to each new build in a manufacturing line making ongoing deployment efficient and stable. Setting up a new variation for a new vessel or vehicle is easy and simply involves duplicating the existing configuration as a base and then modifying the affected components and circuits as required.

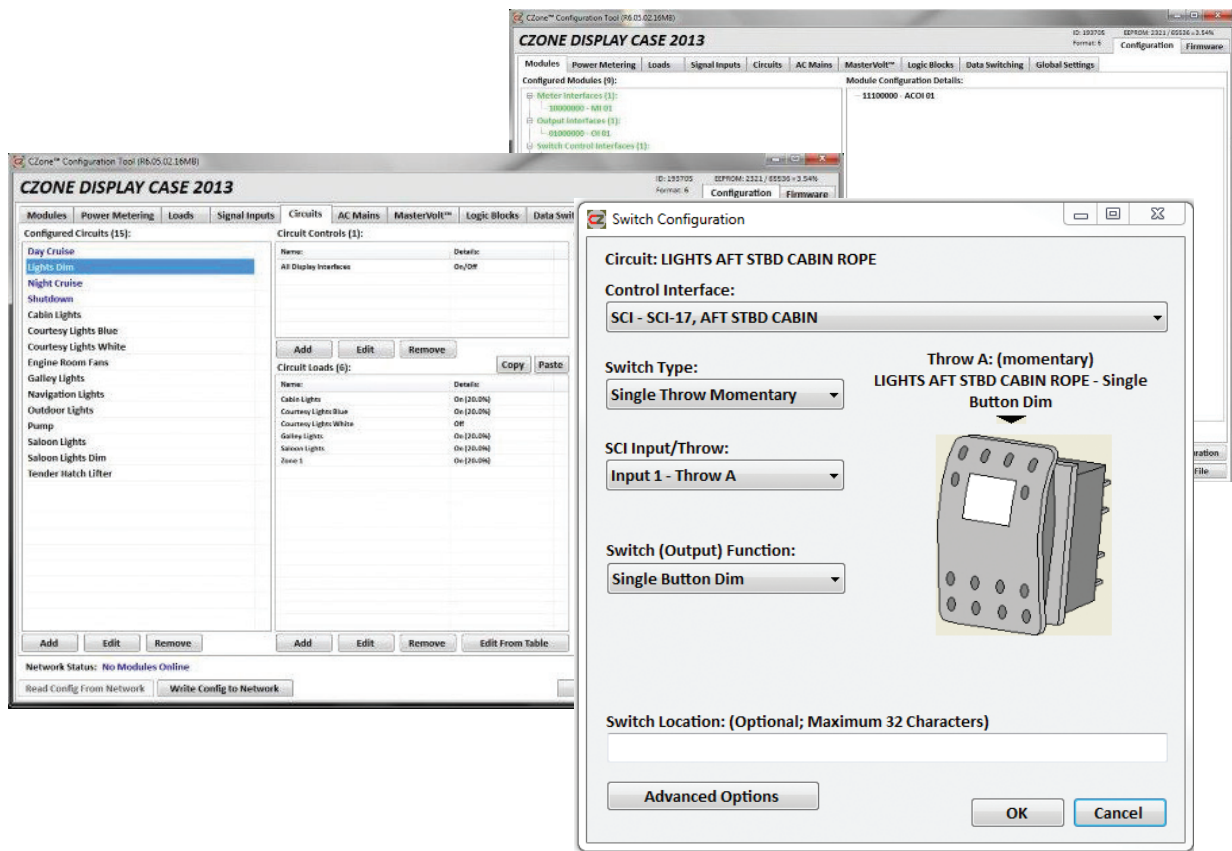


### USB CAN Adapter

Connects PC to the CZone® network for configuration and system set up.

Part # 80-911-0044-00

## Configuration Tool Screen Shots

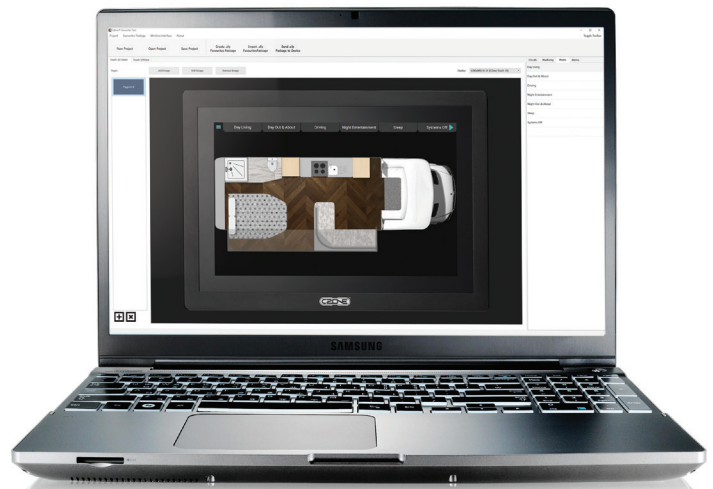


## CZone Favorites Tool

- Import schematic plan view or profile images of the vessel or vehicle
- Allocate modes to the mode favorites banner
- Build multiple favorites pages
- Drag & drop circuits and alarms onto the vessel or vehicle
- 6 X 4 (Touch 10 or tablet) 4 X 2 (Touch 5 or iPhone) grid can feature any selection of desired control switches or monitoring meters.

**Replaces Wireless Interface (WI) Configuration Tool Software.**

The CZone favorites software is available to technical CZone customers from the CZone portal at [downloads.czone.net](http://downloads.czone.net)



## Design your own Favorites Pages

Using CZone's unique new favorites tool, system designers can import plan view layout or schematic drawings and located key circuits in the location they appear on board. Faults with that circuit will display in that location so the user quickly identify the item or circuit at fault and investigate it.

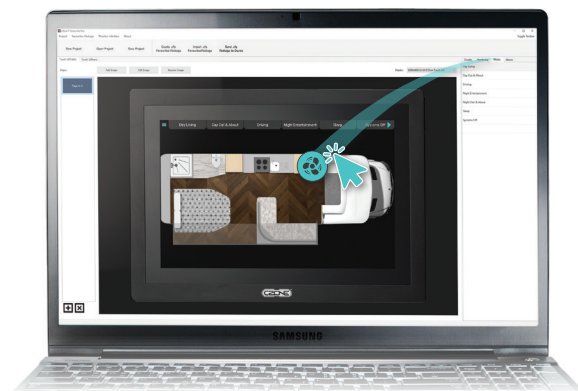
### 1 Image Selection

Start by selecting plan view and profile views of your vessel or vehicle - these work great in the CZone mimic view. When these are not available, an image of the area being controlled will also work.



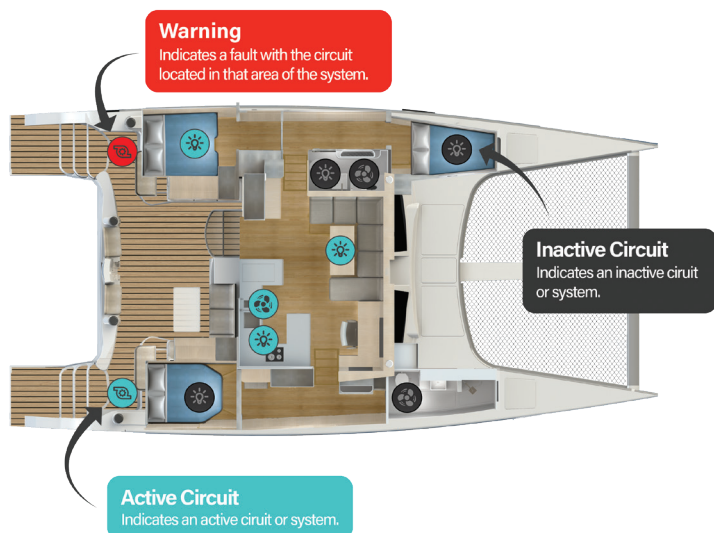
### 2 Design

Import the selected images and the config for your system into the favorites design tool. Drag & drop config controls onto the imported image so it mimics the circuits physical location. Place any number of available controls in the right location. Use multiple pages to place multiple images.



#### Vessel or Vehicle Mimic

Schematic plan views are perfect at illustrating circuit locations. Circuit icons will show if the circuit is active. Any faults with that circuit will display in that location as a warning so the user can quickly identify where to investigate.



#### Grid Layouts

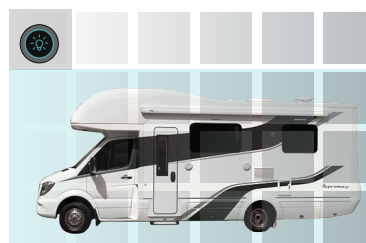
Drag & drop circuits and alarms onto the vessel or vehicle.

- Touch 5 or iPhone uses a 4 x 2 grid layout
- Touch 10 or tablet uses a 6 x 4 grid layout
- Variations in resolution and size ratio are handled automatically

##### 4 x 2 Grid Layout



##### 6 x 4 Grid Layout



### 3 Load to CZone

The CZone favorites tool allows the programmer to upload the new configuration to the connected CZone system via WiFi or SD flash disk.

### Access from any Interface

Access and control the new favorites pages via CZone Touch 5, Touch 10 or wirelessly via connected iPad.



## CZone® Control 1 **NEW**

The Control 1 combines multiple input and output devices in to a single module, minimizing installation time, interconnections and footprint. The Control 1 incorporates many of the core features and benefits of the fully featured Combination Output Interface (COI), but has been re-engineered to offer improved cost-per-channel value. The Control 1 features the same rugged design as the fully featured COI with IPX5 water ingress protection and complete mechanical fuse and bypass on all circuits as required by ABYC/CE. Industry standard Deutsch connectors provide "plug and play" installation.

Part #	Description
80-911-0122-00	Control 1 Interface (connectors not included)

Control 1 Interface	
Channels	24
Output Channels High	4 x 25A
Output Channels Low	12 x 10A dimmable
Analogue Inputs	8x analogue inputs: positive or negative switching, 0-32 volt, 0-1000 ohm resistance & 4-20mA current
Additional Monitoring	Volt sense on main positive stud
Current Sensing	Not available
Circuit Protection	Mechanical ATC fuse override with alarm
Digital Switch Breakout	Not available
Maximum Continuous Current	150A @ 104°F (40°C) - derating above 104°F (40°C)
Power Supply	M8 (5/16") stud positive, M6 (1/4") negative
Voltage	9-32V (with power available LED)
Power Consumption	Operating (all channels on) = 100mA @ 13.2V Operating (all channels off) = 75mA @ 13.2V
Circuit Bypass	Mechanical protection/bypass all output channels
Bilge Pump Circuits	4 x channels high: integrated manual control & pump running detection
Ingress Protection	IPx5 (mounted at 0°, +/-90°)
Communication	NMEA 2000
Certification	CE, ABYC, NMEA, ISO8846/SAE1171 ignition protected
Weight	4.2lb / 1.9kg
NMEA 2000 PGN Output	Fluid level, pressure, temperature, battery volts
Connectors	Deutsch DTP and DT
Dimensions (including cover)	13.3" x 9.3" x 2.4" 338 x 235 x 62mm
Output Voltage	12/24V

### Related Products



**NEW** Waterproof Keypad  
page 32



Misc Accessories  
page 42



### Features

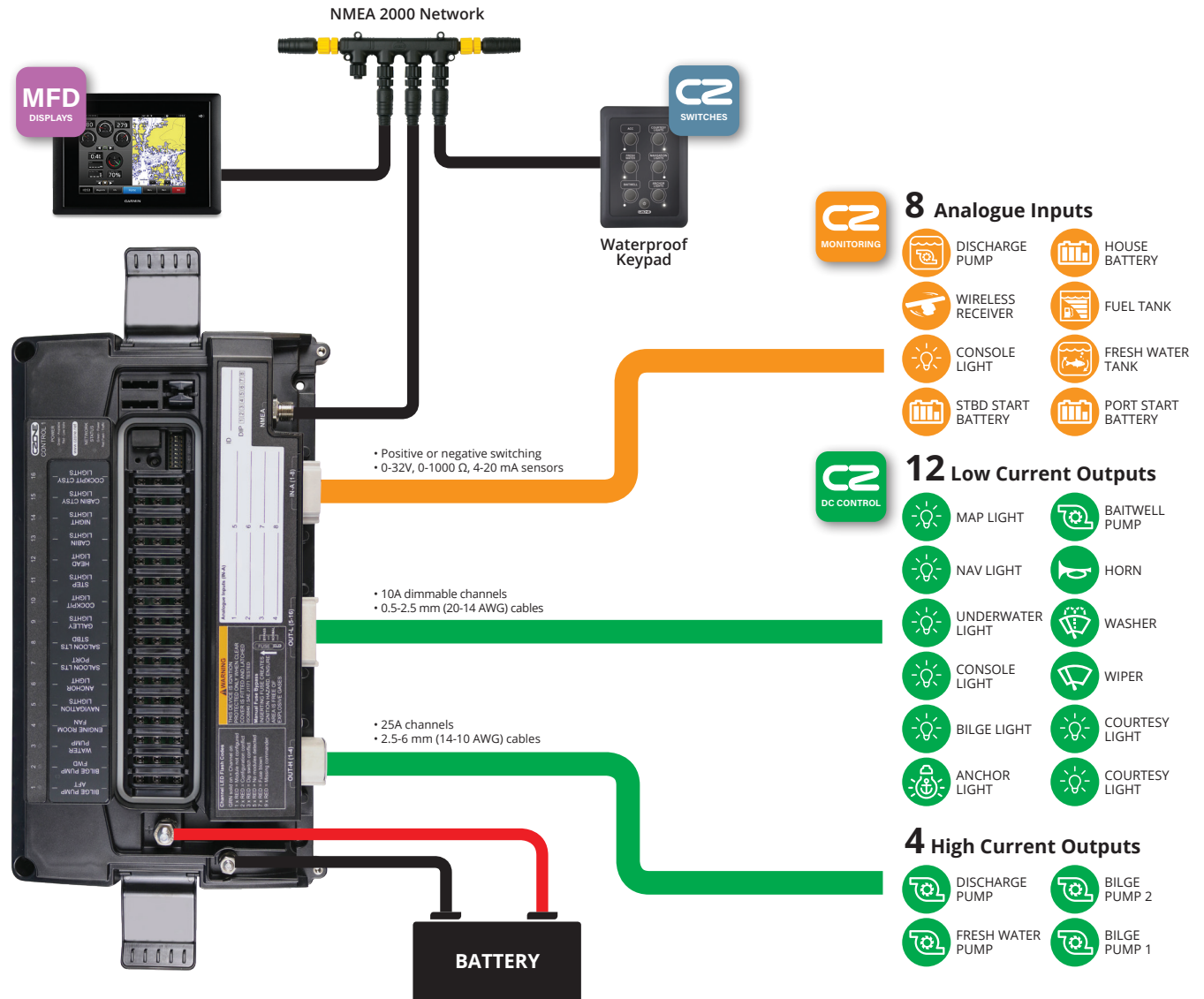
- High density 24 channel module delivering reduce cost per channel
- Designed for small marine or recreational and specialty vehicle application
- Retains core functions available in Combination Output Interface
- Full mechanical fuse protection plus bypass on all circuits as required by ABYC/CE
- Proven, rugged CZone design includes IPX5 Water Ingress Protection and NMEA 2000 certification
- Integrated manual bilge pump control & pump running detection

### Accessories

- 80-911-0131-00** Deutsch connector kit  
Includes all necessary Deutsch plugs, contacts, wafers & seals



## Control 1 System Example



There's a CZone application for every boat type



See page 53

## CZone® Combination Output Interface (COI)

The Combination Output Interface (COI) combines multiple input and output devices into one (1) module, offering a compact and intelligent replacement for traditional DC fuse boxes and circuit breaker panels with digital control and monitoring technology.

Digital control and monitoring systems just became more cost effective and easier to install with the CZone Combination Output Interface (COI). This one box replaces up to five separate units, with convenient Deutsch connectors and IPX5 water resistance, providing a complete CZone system for smaller applications. The COI's high continuous power output (150 amps), plus space, installation time and cost savings also make it the perfect building block for larger systems.

### Quick access and overview

Partnered with either a dedicated CZone display, or with a multi-functional display from one of our integration partners (B&G, Furuno, Garmin, Lowrance, Simrad), the Combination Output Interface heralds a new era in providing simple, intuitive control over the increasingly complex systems found on today's applications.







### Features

- High density 30 channel module minimizes installation, interconnections and footprint, while delivering best value per circuit
- Full mechanical fuse protection plus bypass on all circuits as required by ABYC/CE
- Industry standard Deutsch connectors provide fast, plug-n-play installation
- Optional cable cover offers improved aesthetics and greater mounting flexibility
- Proven, rugged CZone design includes IPX5 Water Ingress Protection and NMEA 2000 certification
- High power Bilge Pump channels allow manual control plus "pump running" feedback from a single channel – without additional wiring
- USB port provides easy system update from USB flash drive

Combination Output Interface	
Channels	30
Output Channels High	4 x 25A
Output Channels Low	12 x 10A dimmable
Analogue Inputs	8 x analogue inputs: positive or negative switching, 0-32 volt, 0-1000 ohm resistance & 4-20mA current
Additional Monitoring	Volt sense on main positive stud & NMEA 2000
Current Sensing	All 16 output channels
Circuit Protection	Configurable digital software fusing & Mechanical ATC Fuse override with alarm
Digital Switch Breakout	Digital Switch Breakout adds 6 digital switch inputs
Maximum Continuous Current	150A @ 104°F (40°C) - derating above 104°F (40°C)
Power Supply	M8 (5/16") stud positive, M6 (1/4") negative
Voltage	9-32V (with power available LED)
Power Consumption	250 mA at 12V 180 mA at 12V standby
Circuit Bypass	Mechanical protection/bypass all output channels
Bilge Pump Circuits	4 x channels high: integrated manual control & pump running detection
Ingress Protection	IPx5 (mounted at 0°, +/-90°)
Communication	NMEA 2000
Certification	CE, ABYC, NMEA
Weight	4.2lb / 1.9kg
NMEA 2000 PGN Output	xxxxxxx
Connectors	Deutsch DTP and DT
Dimensions (including cover)	13.3" x 9.3" x 2.4" 338 x 235 x 62mm
Output Voltage	12/24V

Part #	Description
80-911-0119-00	COI with Connectors (includes 80-911-0131-00—COI Deutsch Connector Kit)
80-911-0120-00	COI No Connectors

Options		
80-911-0123-00	<b>COI cable cover</b> Optional cover for clean finish, covers connectors and cables	
80-911-0134-00	<b>COI Digital Switch Breakout</b> The COI Digital Switch Breakout (DSB) interfaces CZone digital switches with your CZone COI module. Including 2 mtr DSB to COI cable	
80-911-0129-00	<b>5m COI to DSB cable (16ft)</b>	
80-911-0131-00	<b>COI Deutsch connector kit</b> (delivered as standard with 80-911-0119-00) Includes all necessary Deutsch plugs, contacts, wafers & seals for COI	
80-911-0133-00	<b>Deutsch HDT-48-00 crimp tool</b> Crimp tool for Deutsch contacts	

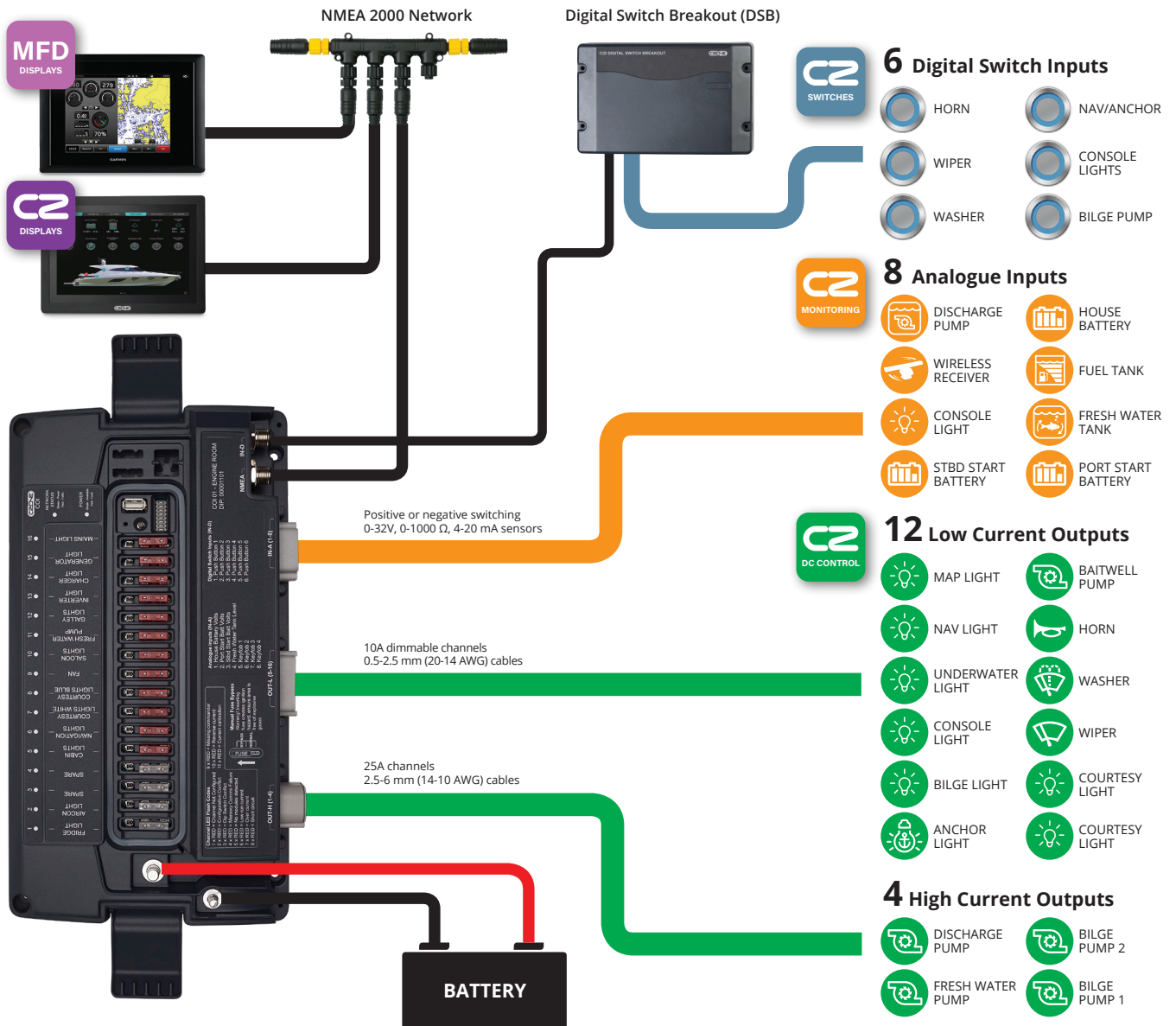
## COI Digital Switch Breakout (DSB)



The COI Digital Switch Breakout (DSB) is the interface between the Combination Output Interface (COI) and up to six CZone digital switches (push button or rocker). The digital switches include dimmable LED backlighting, systems on, fault codes and a plug and play harness simplifying installation.

Part #	Description
80-911-0134-00	DSB (Includes 2m COI to DSB Cable)
<b>Digital Switch Breakout (DSB)</b>	
Connect up to six (6) digital switches to the COI	
Support for single or double throw switches (up to 12 programmable switch points)	
Uses existing SCI switch cables with options for Rocker or push button plugs at various lengths	
Digital switches include dimmable backlighting for 'systems on' and fault codes	
Dimensions (HxWxD): 3.9" x 6.1" x 1.7" (100 x 156 x 42 mm)	
IPX5 water ingress protection	
Includes 2 m DSB to COI cable	

## CZone® COI System Example



## Contact 6 PLUS **NEW**

Utilising proven CZone® digital switching technology the Contact 6 PLUS is a robust and affordable digital switching solution. Featuring 6x 15A solid state ignition protected fused outputs with circuit bypass for system redundancy. The Contact 6 PLUS can be networked into an existing CZone system or installed stand alone with the CZone Waterproof Keypads or compatible Multi-Function Displays.

Contact 6 PLUS	
Circuit Protection	ATC fuse with blown fuse alarms
NMEA 2000 Connectivity	1 x CAN Micro-C port
Output Wire Range	24–8 AWG (0.5 - 6mm)
Output Channels	6 x 15A 12/24V
Maximum Current	60A total module current
Dimming	All channels, PWM @100Hz
Power Supply	M6 (1/4") positive terminal (9–32V)
Network Supply Voltage	9–16V via NMEA 2000
Circuit Bypass	Mechanical fuse bypass on all channels
Ingress Protection	IPx5 (mounted vertical)
Compliance	CE, ABYC, NMEA, ISO8846/SAEJ1171 Ignition Protected
Power Consumption Max	75mA
Power Consumption Standby	0.3mA
Warranty Period	2 years
Operating Temperature Range	-5°F to +131°F (-15°C to +55°C)
Storage Temperature Range	-40°F to +185°F (-40°C to +85°C)
Dimensions WxHxD	7.97" x 5.06" x 1.77" (202.5 x 128.5 x 45mm)
Weight	1.32lbs/600g



### Features

- Circuit dimming & smooth start capability
- Status LED's for all outputs
- Ultra low current draw
- Built-in timer functions for circuits like live bait tanks
- Voltage monitoring on the NMEA 2000 Network
- Built-in Load Shedding allows non-essential loads to be turned off to preserve battery life
- Built-in default configurations selectable via dip switch
- Affordable add-on module to larger CZone systems
- Blown fuse detection and warning

Part #	Description
80-911-0160-00	Contact 6 PLUS Interface (interface only)
Accessories	
80-911-0179-00	Contact 6 PLUS Connector & Seal Kit 1x 6-position Phoenix Plug (with screws) & 1x Gumboot Seal



80-911-0163-00



80-911-0162-00

## CZone Waterproof Keypads **NEW**

- IPX7 waterproof low profile keypads
- Status LEDs with blown fuse fault indication
- Dimmable RGB circuit back lighting
- Available in portrait or landscape with 3 mounting options—front, rear and flush mount
- Easy to install with a single plug connection

Part #	Description
80-911-0162-00	Waterproof Keypad—landscape
80-911-0163-00	Waterproof Keypad—portrait
80-911-0174-00	Waterproof Keypad Spare Parts Kit
Accessories	
80-911-0179-00	Waterproof Keypad Spare Parts Kit
SET-KEYPAD-1	Label set for Waterproof Keypad (marine)



80-911-0171-00

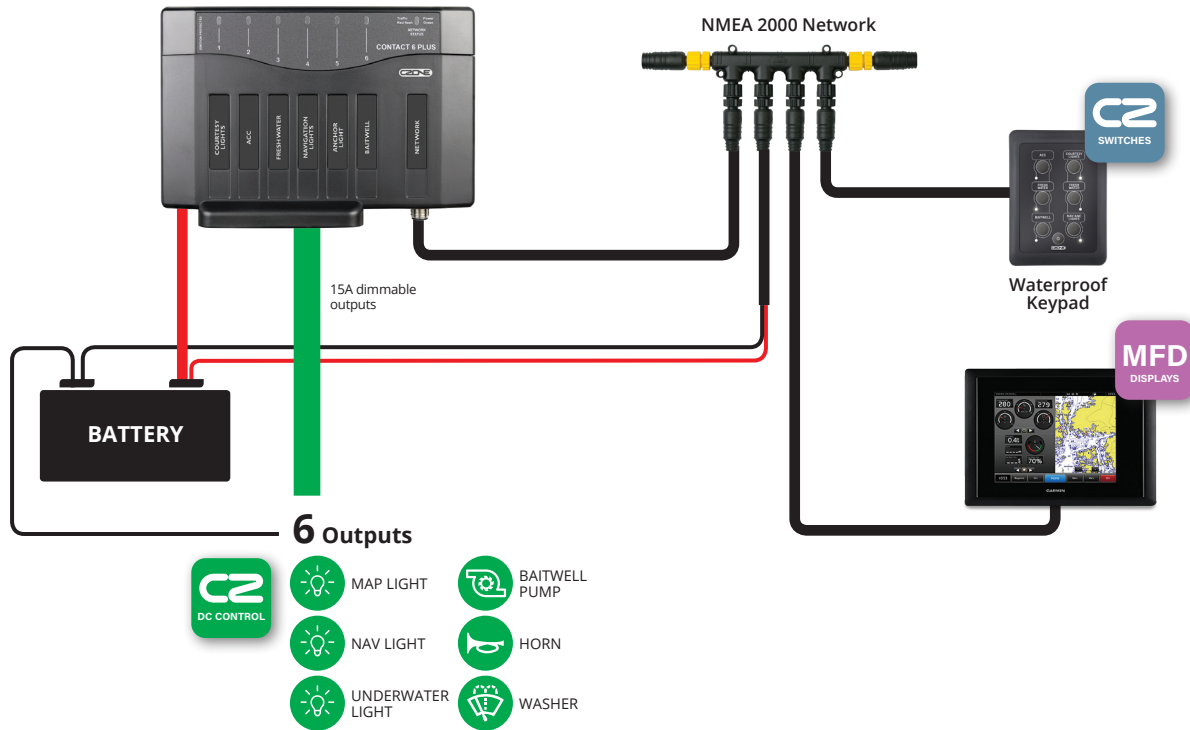
80-911-0172-00

## CZone 2 & 3 Module Smart Harness **NEW**

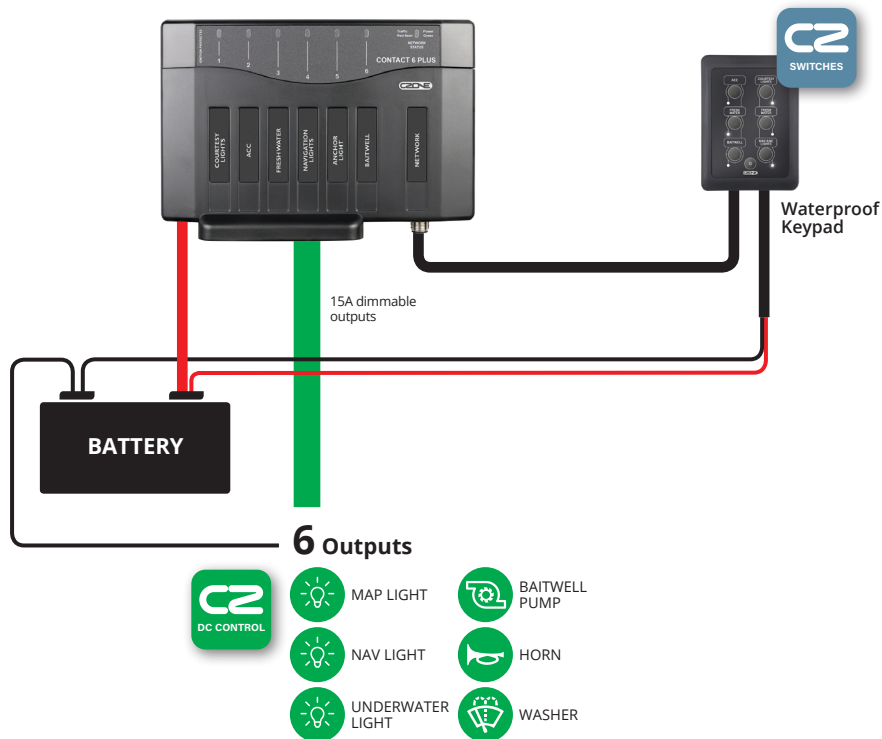
- All in one smart-harness for straight forward plug and play installation
- 3 Module Smart Harness connects two 6-button Waterproof Keypads to the Contact 6 PLUS Module
- Not required when connecting to NMEA 2000 Network

Part #	Description
80-911-0171-00	2 module Smart Harness
80-911-0172-00	3 module Smart Harness

## Contact 6 PLUS Networked System Example



## Contact 6 PLUS Standalone System Example



There's a CZone  
application for every  
boat type



See page 53

### Related Products



Misc Accessories  
page 42

## Contact 6 **NEW**

The Contact 6 is a digital control module that can be networked with other CZone products or stand alone. The Contact 6 has six independent channels that are positively or negatively switched and is ideal for smaller marine applications or recreational and specialty vehicles.

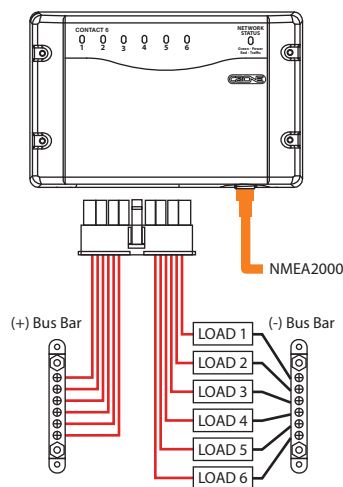
Part #	Description
80-911-0139-00	Contact 6 Fused Interface Only
80-911-0140-00	Contact 6 Fused with Seals & Plug
80-911-0155-00	Contact 6 Non Fused Interface Only
80-911-0156-00	Contact 6 Non Fused with Seals & Plug

### Accessories

80-911-0144-00	Plug Pack* for Contact 6
80-911-0145-00	Cable Gland for Contact 6

\*Plug pack includes mating TE connector and contacts (TE part numbers listed in specifications)

Contact 6	Fused	Non Fused
Output Channels	6 x Relay	6 x Relay
Output Ratings	7.5A max per channel	6x 9A max per channel
Output Voltage	up to 16V DC	up to 30V DC
LED Status indication	Yes	Yes
Parallel	Yes	Yes
Dimming	No	No
Current Sensing	No	No
Circuit Protection	Internal PTC Fuses (auto-reset)	None (must fuse externally)
Overcurrent Alarm	No	No
Circuit Bypass	Yes (electronic)	Yes (electronic)
Connector	Amp 18-way Connector	Amp 18-way Connector
Max Wire Size	16 AWG (1mm <sup>2</sup> )	16 AWG (1mm <sup>2</sup> )
Maximum Current	30A Continuous	30A Continuous
Power Consumption	35mA (standby)	35mA (standby)
NMEA Voltage	9-16V	9-16V
Ingress Protection	IPX5	IPX5
Communication	NMEA 2000	NMEA 2000
Operating Temp	5 °F to 131 °F (-15 °C to +55 °C)	
Certification	CE, NMEA	



### Related Products



Misc Accessories  
page 42



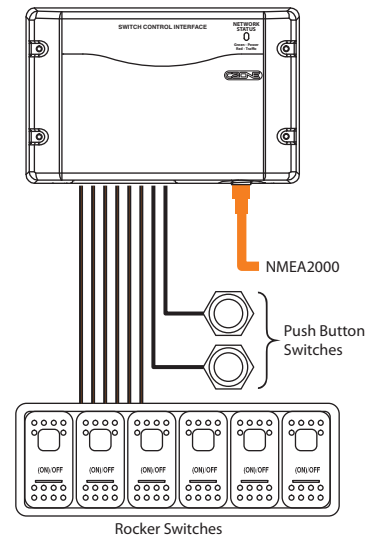
## Switch Control Interface (SCI)

The Switch Control Interface provides an interface between the CZone network and the traditional mechanical switches with which manufacturers and users are familiar. The SCI simplifies your wiring, supports your existing choice of switches, protects against failures and allows for more installation options.

Part #	Description
80-911-0011-00	Switch Control Interface with seal
80-911-0012-00	Switch Control Interface only

### Switch Control Interface (SCI)

Single switch position can control multiple OI channels
Attaches to switch panels via custom SCI cable
Multiple SCI switches can control single OI channel
Output for backlighting of switch labels (dimnable)
Outputs systems on and function/fault codes to systems on LED of switches (dimnable)
Choice of push button or rocker style switch
Dimensions (HxWxD): 3.94" x 6.14" x 1.65" (100x156x42mm)
IPX5 water ingress protection
Programmable switch types
8 inputs per module (16 individual controls)
Sequential button press functionality
Choice of push button or rocker style switch



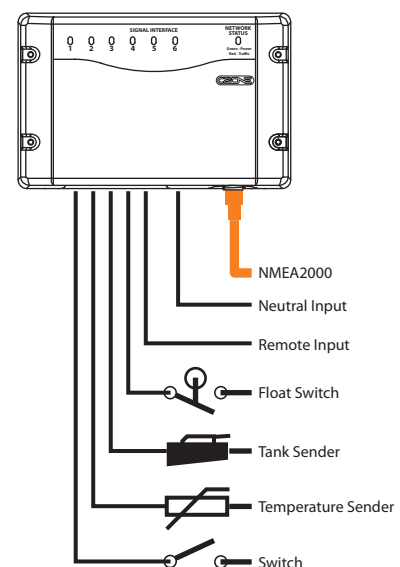
## Signal Interface (SI)

The Signal Interface connects the CZone system to your external sensors, alarms and switching devices. The SI allows intelligent, automated operation of circuits depending on the state of the input.

Part #	Description
80-911-0013-00	Signal Interface with seals, connector
80-911-0014-00	Signal Interface only

### Signal Interface (SI)

Accepts inputs from traditional switch types being used to control outputs
Accepts inputs from switches to trigger alarm i.e. high water float switch
Accepts inputs from industry-standard tank senders (0-5V, 10-180 Ohm, 240-33 Ohm)
Accepts inputs from general voltaic or resistive signals, can be used for controlling outputs or to display a physical position i.e. show a hatch is partially open
LED status indicators for each input
Dimensions (HxWxD): 3.94" x 6.14" x 1.65" (100x156x42mm)
IPX5 water ingress protection
Outputs standard NMEA 2000 fluid, temperature and pressure sentences
Resistive input range 0-1000 Ohms
Voltage sensing input range 0-34V DC



## Output Interface (OI)

The Output Interface provides an intelligent replacement for traditional circuit breaker and fuse panels. It has six high power, robust output channels which provide the power supply, control and fusing for a circuit as well as integrating many other features such as timers and dimmers. Connection to the unit is simple: a large 6-way plug allows connections to cables of up to 16 mm<sup>2</sup> (6 AWG) in size, or multiple smaller conductors. No need for specialized crimp terminals and expensive crimp tools to be carried for terminations to CZone, just a blade screwdriver. A protective flexible boot offers protection to the connections from harsh environment conditions.

Part #	Description
80-911-0009-00	Output interface with connector and protective boot
80-911-0010-00	Output interface only

### Output Interface (OI)

4 levels of backup fusing including manual override (as required by ABYC)

Multiple channels can be bridged together to offer higher current switching

Power consumption 12V: 85 mA

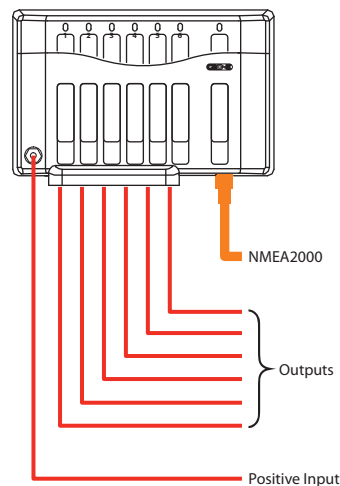
Dimensions (HxWxD): 5" x 7.87" x 1.75" (128x200x45mm)

Small, non-metallic, easy to install case

IPX5 water ingress protection

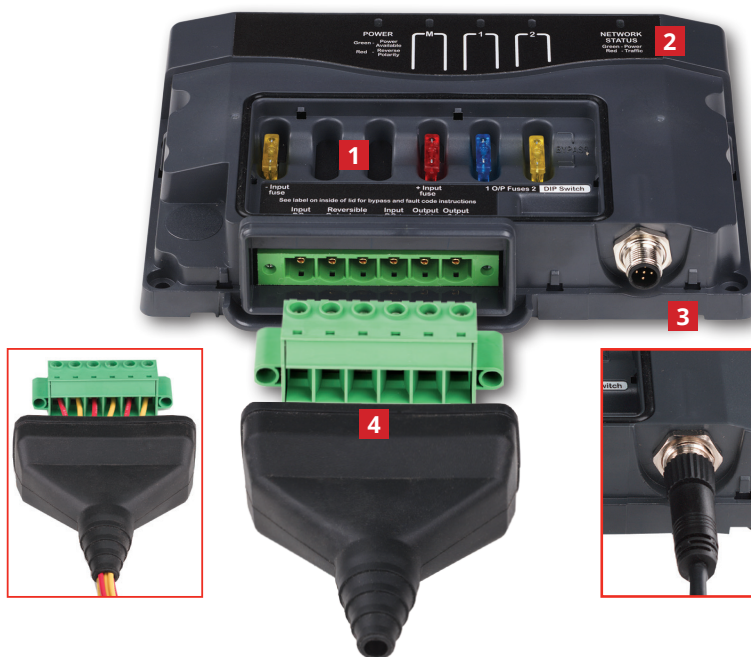
6 x 20 amps circuits

Programmable software 'fuse' sizes



### Output Interface Parts

- 1** Fuses for emergency circuit bypass
- 2** Network status indicator
- 3** NMEA 2000 connector
- 4** Connector and protective boot



## Motor Output Interface (MOI)

The Motor Output Interface has an output pair for controlling DC motors which require a reversal of polarity to change the direction of their mechanical operation. For example, a DC motor for an electric window mechanism will move the window up or down depending on the polarity of the feed to the motor. The MOI also incorporates two standard output channels as found on the OI.

Part #	Description
80-911-0007-00	Motor Output Interface with connector and protective boot
80-911-0008-00	Motor Output Interface only

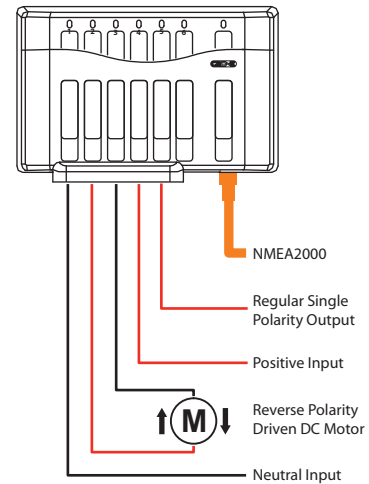
### Motor Output Interface (MOI)

Single motor control and two normal channels per unit, 20A per output

Built-in circuit protection

IPX5 water ingress protection

Dimensions (HxWxD): 5" x 7.87" x 1.75" (128x200x45mm)



## Meter Interface (MI)

The Meter Interface accepts inputs from external AC and DC power metering sensors such as: AC and DC voltage and amps, AC kWatts, and DC battery capacity in amp hours and percentage remaining. All with user definable high and low alarms.

Part #	Description
80-911-0005-00	Meter Interface, with seal and plug
80-911-0006-00	Meter Interface only

### Meter Interface (MI)

#### General

Dimensions (HxWxD): 6.14" x 3.94" x 1.65" (156x100x42 mm)

IPX5 water ingress protection

Outputs standard NMEA 2000 power monitoring sentences

#### AC

3 x AC voltage inputs (multi voltage)

2 x AC current inputs

Calculates true RMS power

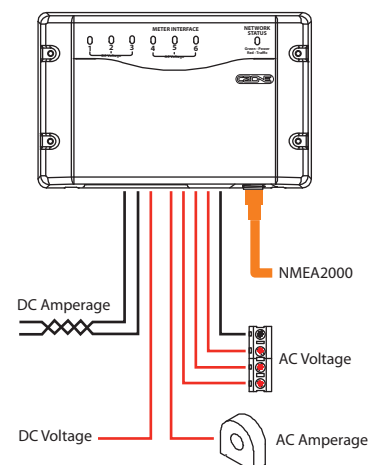
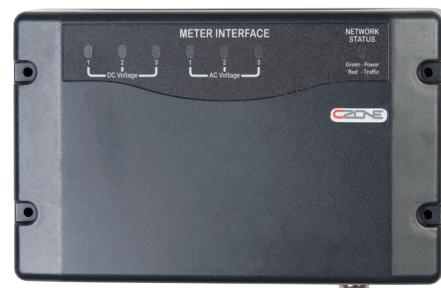
#### DC

3 x DC voltage inputs (multi voltage)

2 x DC current inputs

Calculates battery capacity as ampere hours and percentage charge remaining

Resolution for current metering down to 0.1A



## CZone® AC Output Interface (ACOI)

Simplify the way you network, monitor and control onboard AC circuits. The AC Output Interface does it all and provides circuit protection for all onboard AC devices. It is easy to install, configure and operate the digital control system with pre-wired components for quick connections. This gives you a customizable solution to suit unique installation and application needs, including 'night running' or 'at anchor' as well as control at multiple locations. It has eight outputs (up to 50A each), supports multiple pole designs and multiple separate buss feeds. To make it easy, status LEDs and manual bypass are located right at the enclosure.

**ACOI is a custom ordered product. Each Customer's ACOI will vary based on their requirements. Contact your account manager for requirements.**

### AC Output Interface (ACOI)

Circuit status and run current displayed for each circuit
Customizable to suit installation requirements
Pre-wired for quick connection
Staggered start up of loads
110V, 240V, 110/220V
Supports multiple pole designs, i.e. double, triple, four pole
Utilizes standard DIN rail mounted components for circuit protection and control
Can support two separate buss feeds (i.e. 2 load groups) in one box
Delay before circuits come on to allow generators to come up to speed
Provides circuit protection and control
Status LEDs at enclosure
Manual bypass at enclosure
Provision for MCB/RCDs
Timers
50 or 60 Hz



### ACOI Standard

- 8 x 50A relays protected with 10A MCB's
- Pre-wired
- Current monitoring on each channel
- IPX5 enclosure
- Dimensions (HxWxD):  
17" x 10.8" x 7.3" / 430 x 276 x 186 mm

**Part # 80-911-0069-00** This part number will change. This should only be used for quoting purposes.



### ACOI Dinrail Mount

- 8 x 50A relays
- Fitted with 600 mm tails
- Cost effective solution, own enclosures and MCB's can be sourced
- Current monitoring on each channel
- Dimensions (HxWxD):  
3" x 6.3" x 2.4" / 77x160x60 mm

**80-911-0096-00** Black tails (US)

**80-911-0082-00** Brown tails (APAC/Europe)

## CZone® AC Mains Interface (ACMI)

A sophisticated source selector or transfer switch, the AC Mains Interface enables the user to specify which AC power source is actively supplying power to the ship (generator, inverter, or shore power). Developed for use with the CZone digital control system, but may also be used as a stand-alone device. The ACMI can be programmed to automatically change the supply source when the current rating is exceeded, and includes a manual override and user-friendly display screen that ensures easy current, voltage, frequency, and power monitoring. Other features include six monitored, over-current protected main power inputs of up to 100A each, as well as two outputs, which enables two separate load groups and a parallel option for use with a single source. To simplify installation, the ACMI comes pre-wired for easy installation.

**ACMI is a custom ordered product. Each Customer's ACMI will vary based on their requirements. Contact your account manager for requirements.**

AC Mains Interface (ACMI)
6 Source inputs up to 125A (eg. 2x shore power, 2x generator)
Monitoring of channel status (on/off/fault)
Provides circuit protection and control
Manual override at enclosure and via remote panel
Customizable to suit installation requirements
Supports multiple pole designs, i.e. double, triple, four pole
110V, 240V, 110/220V
IPX5 enclosure
Utilizes standard DIN rail mounted components for circuit protection and control
Current, voltage, frequency and power monitoring incorporated (six channels)
Physical and software lockouts between source controls (prevents two sources from becoming connected)
Reverse polarity and bad power supply alarms including auto disconnect and lockouts
2 Outputs (load groups), allows for two separate load groups with parallel option for use with single source
Auto changeover (non-seamless)
Provision for RCD's
Load shedding
Status LEDs at enclosure
Pre-wired for quick connection
Timer controls
50 or 60 Hz



### ACMI Standard

- Three (3) Inputs—1x 16A Shore Power, 1x 32A Shore Power, 1x 50A Generator with Parallel
- Two (2) Load Groups—40A
- 230V AC 50Hz
- Current, voltage, frequency and power monitoring incorporated
- Manual override panel on enclosure
- Dimensions (HxWxD):  
17" x 21.3" x 7.3" / 430 x 540 x 186 mm

**Part # 80-911-0068-00**

This part number will change. This should only be used for quoting purposes.

# ACCESSORIES

## NMEA 2000 Approved Cables & Connectors

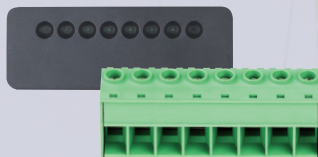
42



NMEA 2000 approved cables and connectors for creating or expanding an NMEA 2000 network quickly and easily. Ends are color coded to make identifying the power cable or connector easy. Premium quality. Universal fit.

## CZone Installation Accessories

43



Various components that are necessary to properly install a CZone digital control and monitoring system.

## CZone® Wireless Remote Kit

47



Simple to set up, wireless remote control. Buttons are configurable for momentary on or latching control of circuits.



# ACCESSORIES

## USB CAN Adapter

47



Connects PC to the CZone® network for configuration and system set up.

## Push Button Switches

45



3.5 volt switches designed to work exclusively with CZone® systems. Momentary and latched actuation options are available.

## Wireless Interface

46



Allows your iPad® to interface with an onboard digital control and monitoring system for full monitoring and control of the electrical equipment via a clear and intuitive display. The interface acts as a hub for the seamless connection between the two popular digital control and monitoring protocols of MasterBus and CZone®.



## NMEA 2000 Network Components



### Single Tee Connector

Connects a single device into the NMEA backbone.

Part # 80-911-0029-00



### 2 Way Tee Connector

Connects multiple devices into the NMEA backbone.

Part # 80-911-0047-00



### 4 Way Tee Connector

Connects multiple devices into the NMEA backbone.

Part # 80-911-0048-00



### Terminating Resistors

Use at either end of the NMEA backbone to complete the network. Each network must have a male and female terminator.

Part # 80-911-0031-00 Male

Part # 80-911-0030-00 Female



### 90° Elbow Connector

Space saving connector for modules, displays and cabling connections.

Part # 80-911-0046-00



### Power Isolator

Used for isolating power between two (2) independent NMEA 2000 networks.

Part # 80-911-0137-00



### Power Cable

Provides power to the NMEA 2000 network. 18 AWG/0.8mm<sup>2</sup> conductors meet ABYC/CE standard for minimum conductor size plus add connection to protect the network from electromagnetic interference.

Part # 80-911-0028-00 3.2 ft 1 m



### Backbone Cable

Special low volt drop Backbone Cable ensures ultimate reliability for your NMEA 2000 network.

Part # 80-911-0026-00 1.6 ft .5 m

Part # 80-911-0027-00 6.5 ft 2 m

Part # 80-911-0024-00 16 ft 5 m

Part # 80-911-0025-00 32 ft 10 m



### Drop Cable

Thinner, more flexible Drop Cables connect individual devices to the NMEA network. New 3 ft/1m length adds convenience.

Part # 80-911-0116-00 1.6 ft .5 m

Part # 80-911-0117-00 3.2 ft 1 m

Part # 80-911-0118-00 6.5 ft 2 m

Part # 80-911-0115-00 16 ft 5 m



### Through Bulkhead Adaptor

For use on the backbone to transition through a waterproof bulkhead or can be used to connect removable equipment such as a computer interface.

• NMEA 2000 Network

Part # 80-911-0052-00



80-911-0054-00

80-911-0053-00

### Field Serviceable Connectors

For terminating bare NMEA cable.

• NMEA 2000 Network

Part # 80-911-0054-00 Male

Part # 80-911-0053-00 Female



### Blanking Caps

Protects unused Tee Connector from dust and water.

Part # 80-911-0050-00 Male

Part # 80-911-0051-00 Female

## Terminal Blocks, Glands, Seals, & Hole Plugs



### Cable Gland, MI

- Silicone

Part # 80-911-0033-00



### Cable Gland for SCI

- Silicone

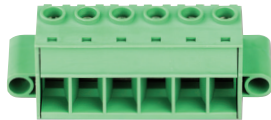
Part # 80-911-0035-00



### Cable Gland SI

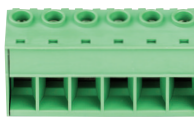
- Silicone

Part # 80-911-0036-00



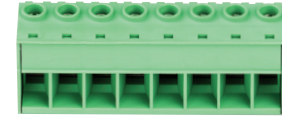
### Terminal Block OI/MOI, 6 Way

Part # 80-911-0041-00



### Terminal Block for MI, 6 Way

Part # 80-911-0042-00



### Terminal Block SI/MI, 8 Way

Part # 80-911-0043-00



### Seal Boot for OI/MOI, 6-Wire

- Black silicone

Part # 80-911-0034-00



### Hole Plugs

- 3.2 mm for MI and SI cable glands
- 5 mm for SCI cable glands

Part # 80-911-0016-00 3.2 mm

Part # 80-911-0017-00 5 mm

## Touch 10 Accessories



### Spare Power Cable

Supplies power for Touch 10 display

- 2 pin, 6.5 ft (2 m)

Part # 80-911-0032-00

## Control 1, COI & DSB Accessories

Accessories & spares for Control 1, Combination Output Interface (COI) and Digital Switch Breakout (DSB).



### COI Cable Cover

Part # 80-911-0123-00



### COI/Control 1 Deutsch Connector Kit

Part # 80-911-0131-00



### COI to DSB Cable, 5m

Part # 80-911-0129-00



### Deutsch HDT-48-00 Crimp Tool

Part # 80-911-0133-00

## Contact 6 Accessories **NEW**



**Cable Gland**

Part # 80-911-0145-00



**Plug pack**

Part # 80-911-0144-00

## Contact 6 PLUS Accessories **NEW**

### Connector & Seal Kit

This kit contains additional or replacement parts suitable for the Contact 6 PLUS Module (80-911-0160-00).

- 1x 6-position Pheonix Plug (with screws)
- 1x Gumboot Seal

Part # 80-911-0179-00



## CZone Smart Harness

### 2 & 3 Module Smart Harness **NEW**

CZone utilizes the industry standard NMEA 2000 Network for its communication protocol. The new 2 & 3 Module Smart Harnesses replace the need for a complete network backbone in a small system, meaning a robust, simpler and more cost-effective installation. The Smart Harness is design for Contact 6 PLUS, but can also be fitted independent to any CZone installation where a small network comprising 2 or 3 devices is required.

- All in one smart-harness for straight forward plug and play installation
- 3 Module Smart Harness connects two 6-button Waterproof Keypads to the Contact 6 PLUS Module
- Not required when connecting to NMEA 2000 Network



80-911-0171-00

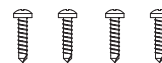
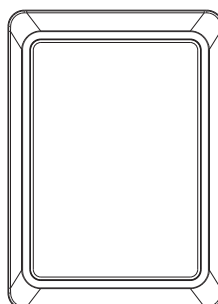
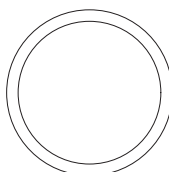
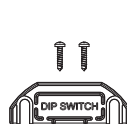
80-911-0172-00

## Keypad Accessories **NEW**



### Label Set for Waterproof Keypad

Part # SET-KEYPAD-1



### Waterproof Keypad Spare Parts Kit

Part # 80-911-0174-00

## Push Button Switches & Accessories



### Push Buttons

For use with CZone systems only (3.5 Volt)

- Momentary and latched actuation options available
- Blue and red circuit status indication LED options
- 19 mm mounting hole
- IP67 environmental protection
- Stainless Steel components
- Maximum 5 amps each

<b>Part # 80-911-0060-00</b>	Momentary (ON)OFF	red LED
<b>Part # 80-911-0063-00</b>	Latching ON/OFF	red LED
<b>Part # 80-911-0062-00</b>	Momentary (ON)OFF	blue LED
<b>Part # 80-911-0061-00</b>	Latching ON/OFF	blue LED



### Push Button Cable Assembly

Suitable for Switch Control Interface (SCI) and Digital Switch Breakout (DSB) compatible with push buttons.

<b>Part # 80-911-0085-01</b>	.5 meter
<b>Part # 80-911-0086-01</b>	1 meter
<b>Part # 80-911-0087-01</b>	2 meter
<b>Part # 80-911-0088-01</b>	5 meter
<b>Part # 80-911-0089-01</b>	8 meter

## Rocker Switches & Accessories



Multiple rocker labels available upon request

### Custom Rocker Switches

Red or blue systems in operation and backlighting LED's.

<b>Part # 80-911-0037-00</b>	ON/OFF	red LED
<b>Part # 80-911-0038-00</b>	mom ON/OFF	red LED
<b>Part # 80-911-0039-00</b>	ON/OFF/ON	red LED
<b>Part # 80-911-0040-00</b>	mom ON/OFF/mom ON	red LED
<b>Part # 80-911-0066-00</b>	mom ON/OFF	blue LED
<b>Part # 80-911-0071-00</b>	mom ON/OFF/mom ON	blue LED



### Rocker Switch Cable Assembly

Suitable for Switch Control Interface (SCI) and Digital Switch Breakout (DSB) compatible with rocker switches.

<b>Part # 80-911-0018-00</b>	.5 meter
<b>Part # 80-911-0019-00</b>	1 meter
<b>Part # 80-911-0020-00</b>	2 meter
<b>Part # 80-911-0021-00</b>	3 meter
<b>Part # 80-911-0022-00</b>	4 meter
<b>Part # 80-911-0023-00</b>	5 meter

### Contura and Rocker Switch Mounting Brackets

- Mount multiple Contura or Rocker style switches in one opening
- Provides a neat, finished appearance on dash or panel surfaces



**1001718**  
Plug



**1001717**  
Single



**1001703**  
End (L or R)



**1001702**  
Double



**1001701**  
Triple (plug included)

## Network Interfaces



### CZone® Network Bridge Interface

For isolating sections of an NMEA 2000 network to decrease standby current draw. Isolation when bridging between two CAN networks, (eg connecting CZone to Simrad Simnet). For expansion of the NMEA 2000 network when the maximum node limit for the network has been reached (node = any device connected to the NMEA 2000 network). Once fitted, 40 additional nodes can be added.

Part # 80-911-0057-00



### MASTERVOLT

### CZone®-MasterBus Bridge Interface

The CZone MasterBus Bridge Interface physically connects the MasterBus and CZone networks together, enabling the two networks to communicate and act as one. This provides seamless control and monitoring of Mastervolt power electronics from CZone displays or partner products.

#### Features:

- Control of Mastervolt inverters and chargers from CZone displays, switches or integrated products
- Display MasterBus acquired systems information such as tank and power levels on CZone displays
- Transfer of alarms between both systems

Part # 80-911-0072-00

More info  
on page 23



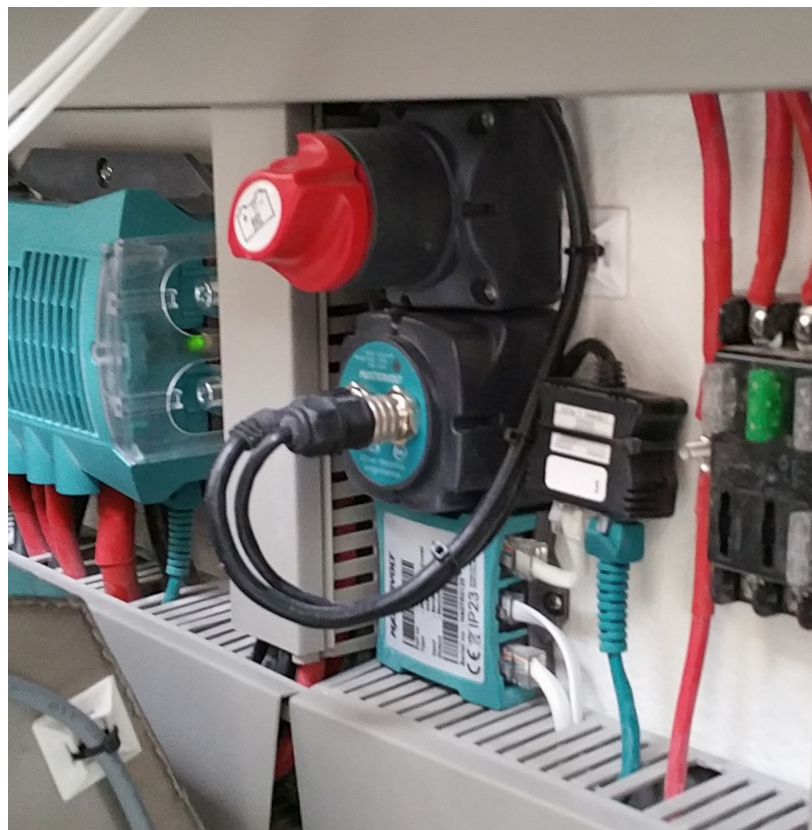
### Wireless Interface

Wireless monitoring and control of onboard systems from your tablet. Allows your tablet to interface with an onboard digital control and monitoring system for full monitoring and control of the electrical equipment via a clear and intuitive display. The interface acts as a hub for the seamless connection between MasterBus and CZone.

Part # 80-911-0090-00 Wireless Interface

Part # 80-911-0095-00 WI MasterBus connector  
(required for MasterBus connection)

Dimensions (hwxwd)	2.7 x 2.7 x 2 inch / 69 x 69 x 50 mm
Weight	0.32 lb / 145 g
Protection	IP65
Includes	Cable adapter, Terminator, User's manual



## Misc Accessories

### CZone® Wireless Remote Kit

Simple to set up, wireless remote control. Buttons are configurable for momentary on or latching control of circuits.

- 250 ft (80 m) operating range
- Kit includes two (2) key fobs and a receiver box
- Rolling code
- Key fob available separately (80-911-0070-00)

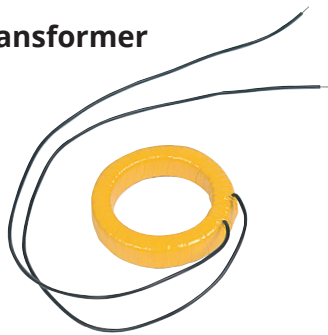
Part # 80-911-0045-00



### Heavy-duty Current Transformer

- Maximum current 150A AC
- CT-HD is available for systems with large mains cables, too large for CT-10-3 (ordered separately)
- CT-HD dimensions: Ø 1.85 x 0.4" (Ø 47 x 10.5 mm)
- Hole size: 1.25" (32 mm)

Part # CT-HD



### Current Transformer

- Maximum current 150A AC
- One CT-10-3 current transformer is supplied with ACSM. If a twin line system is in use, a second CT must be ordered.
- Dimensions: 1.5" x 1.55" x .55" (37.5x39.2x13.7 mm)
- Hole size: 0.5" (12 mm)

Part # CT-10-3



### AC Transducer

- Includes 3 voltage transformers for up to 3 voltage inputs
- 2.75" x 5.5" x 2" (69 x 140 x 50 mm)
- Used for AC voltage measurement

Part # AC-VSEN-4



### Surge Protection Module

Protect your electronics from becoming damaged by harmful high voltage spikes. When fitted to the battery supply these modules look for sudden increases in voltage then switch into protection mode to absorb and suppress the high energy spike.

Part # 80-707-0004-00 12V DC

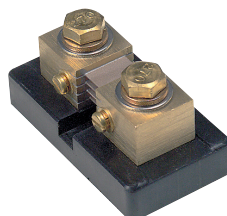
Part # 80-707-0005-00 24V DC



### DC Current Shunt

- 450A / 50 mV shunt supplied with 80-600-0021-00
- 3.25"L x 2.8"W x 2.75"H (83L x 45W x 44H mm)

Part # LB-450-50



### USB CAN Adapter

Connects PC to the CZone network for configuration and system set up.

Part # 80-911-0044-00



# SYSTEM INTEGRATORS



# SYSTEM INTEGRATORS



## The Power Products Advantage

Every customer's needs are different. System Integrators will always tailor our service to ensure our customers get the best value possible and we can support them on delivering their product.

There is a solution for all boat and RV types.



### Power Products Companies & Brands:



CZone® is the industry leader in digital control and monitoring.



Mastervolt engineers and designs power management systems for marine, mobile and industrial applications.



BEP is recognized as the global leader and innovator of the renowned CZone digital switching platform.



Blue Sea Systems is the global leader in battery management solutions and circuit protection for harsh environment marine and vehicle applications.



ProMariner is the leading brand of sealed battery chargers sold to marine OEM and aftermarket channels as well as selected automotive and specialty vehicle applications.



Marinco specializes in harsh environment cable solutions and electrical components.



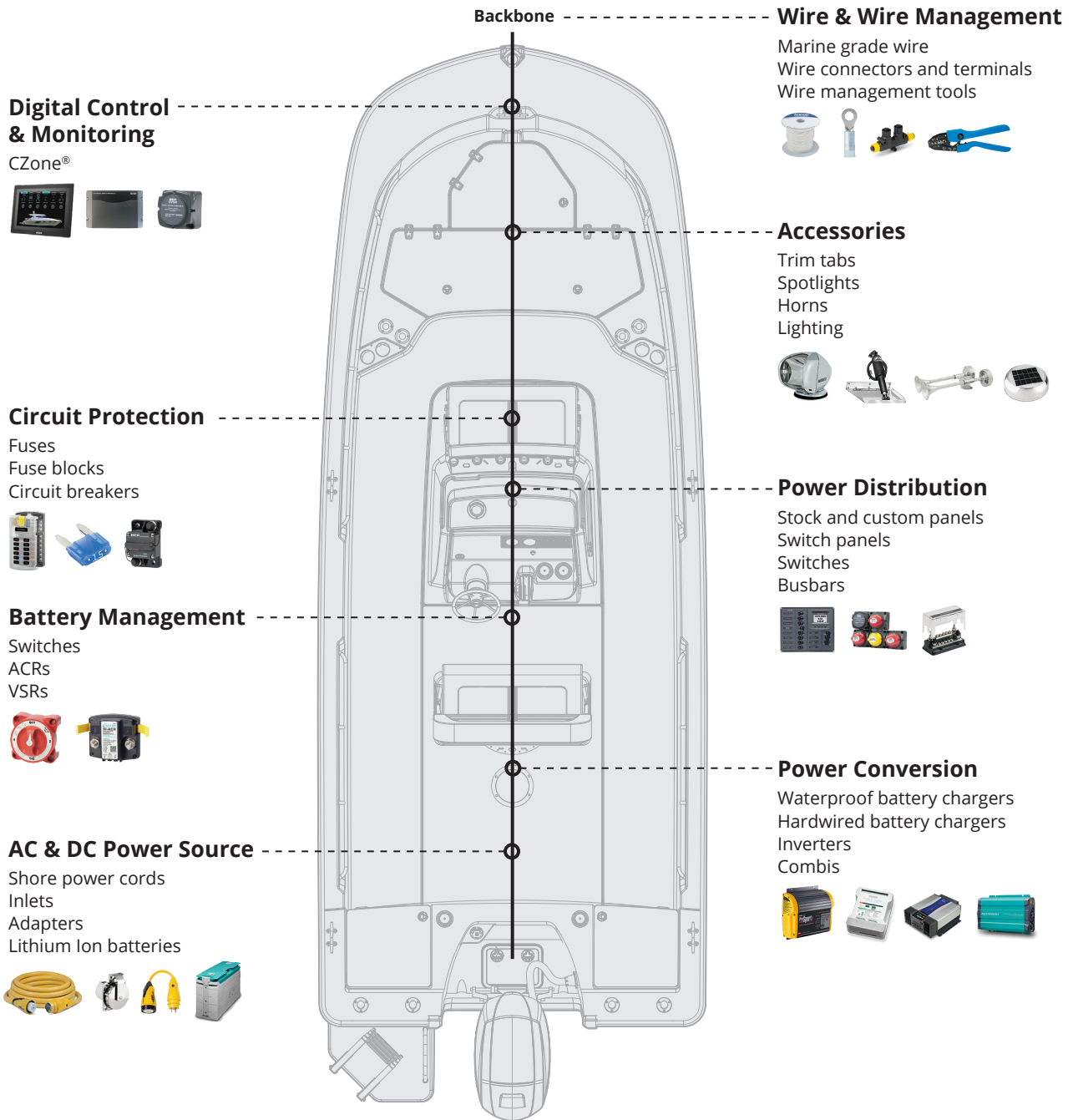
ANCOR supplies harsh environment wire and cable, replacement lighting, tools and wire management solutions.



Lenco Marine is the leader in trim tabs, electric actuators, hatch lifts, switches and the all new Auto Glide boat leveling system.

## Providing more than products. Providing solutions.

Power Product's extensive portfolio of marine electrical components and accessories ensures that we can provide the solution for all your electrical needs from stern to bow. Power Products System Integrators can guide the design and implementation from the simplest to the most complex electrical systems.



## A complete partnership

Power Products System Integrators, a division of Power Products LLC, provides comprehensive electrical system integration services. System Integrators is your turn-key resource on everything from basic analog systems to full CZone Digital Control and Monitoring.

Our expert team of marine and mobile electrical engineers ensures optimum system requirements including hardware, wire harnessing, and installation. Working directly with our OEM partners, System Integrators helps identify key performance requirements of the electrical system, and then provides design services, wire harnessing, and full system production / integration including:

### System Design



### Production



### Configuration

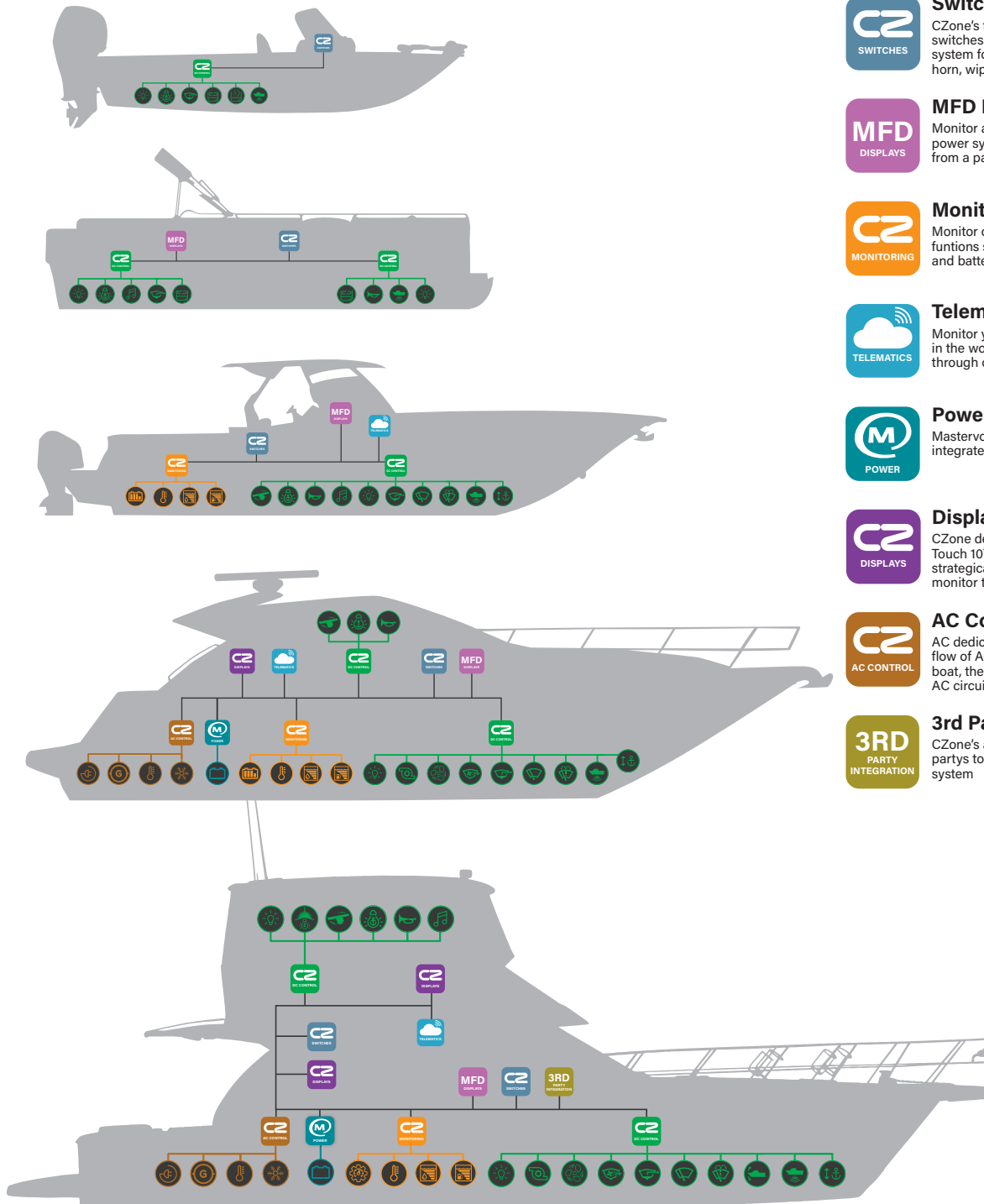


### Support



# Designed for your application

From simple stand-alone to fully networked systems, there's a CZone digital control and monitoring solution for every boat type



## DC Control

Detailed control of all wired DC loads from 9-32V via a range of modules



## Switches

CZone's flexibility allows for manual switches to be integrated into the system for critical functions such as horn, wipers, and bilge



## MFD Integration

Monitor and control the onboard power system circuits directly from a partner MFD



## Monitoring

Monitor critical on-board functions such as tank levels and battery levels



## Telematics

Monitor your boat from anywhere in the world by utilizing telematics through one of CZone's partners



## Power Integration

Mastervolt power sources easily integrate into the CZone system



## Displays

CZone dedicated Touch 5" and Touch 10" screens can be positioned strategically on-board to control and monitor the electrical system



## AC Control

AC dedicated modules control the flow of AC power coming into the boat, then monitors and protects AC circuits



## 3rd Party Integration

CZone's adaptability allow for 3rd parties to integrate into a CZone system

## System Design

System Integrators offer comprehensive design services and support for everything from panel design and wiring layout through to full CZone system design and implementation. Our Systems Engineering team combine industry standard best-practice and training with an in-depth knowledge of our wide range of industry-leading products. The result is a manufacturer designed and supported solution based on the customer's project specific needs.

### CZone System

#### Electrical System

#### Custom Panels

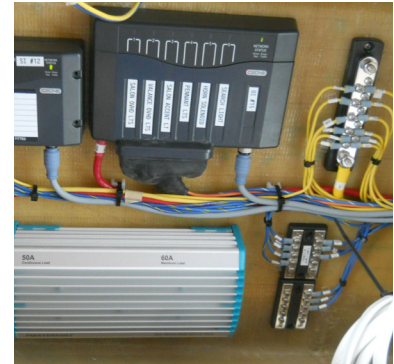
### CZone System

- Custom system design based on customer requirements
- Perform all configurations and logic programming
- Complete mode analysis and optimization



## Electrical System

- Design of complete electrical system based on individual requirements
- Access to market-leading electrical brands
- Ability to design both simple and complex power conversion systems



## Custom Panels

- Unique, customer specific panels for optimized power distribution
- Wide range of AC and DC panel functions
- Comprehensive line of digital monitors and meters



## Production

System Integrators has the expertise to assist production from start to finish. Depending on customer needs we can provide:

## System Components

## Installation Illustrations

## Harnessing

## Training

## Custom Kitting

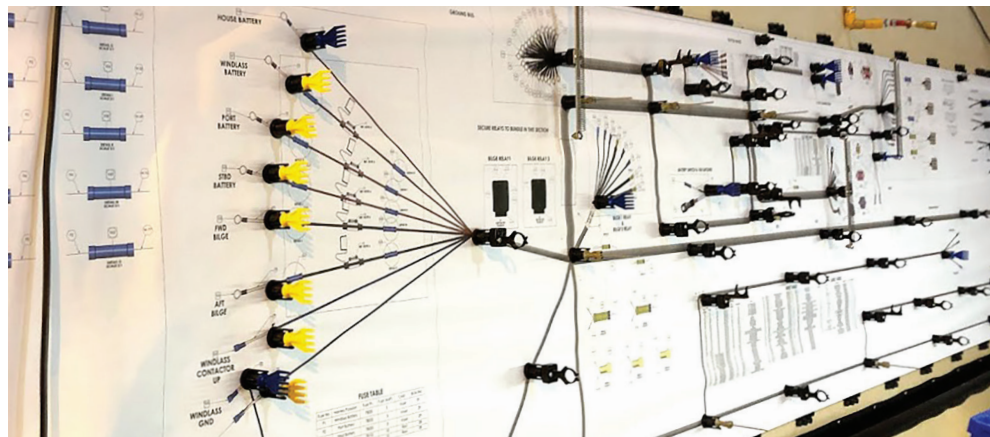
## System Components

- Both AC and DC components plus all power conversion components
- Direct access to the leading marine and mobile electrical brands
- Products are designed to work together



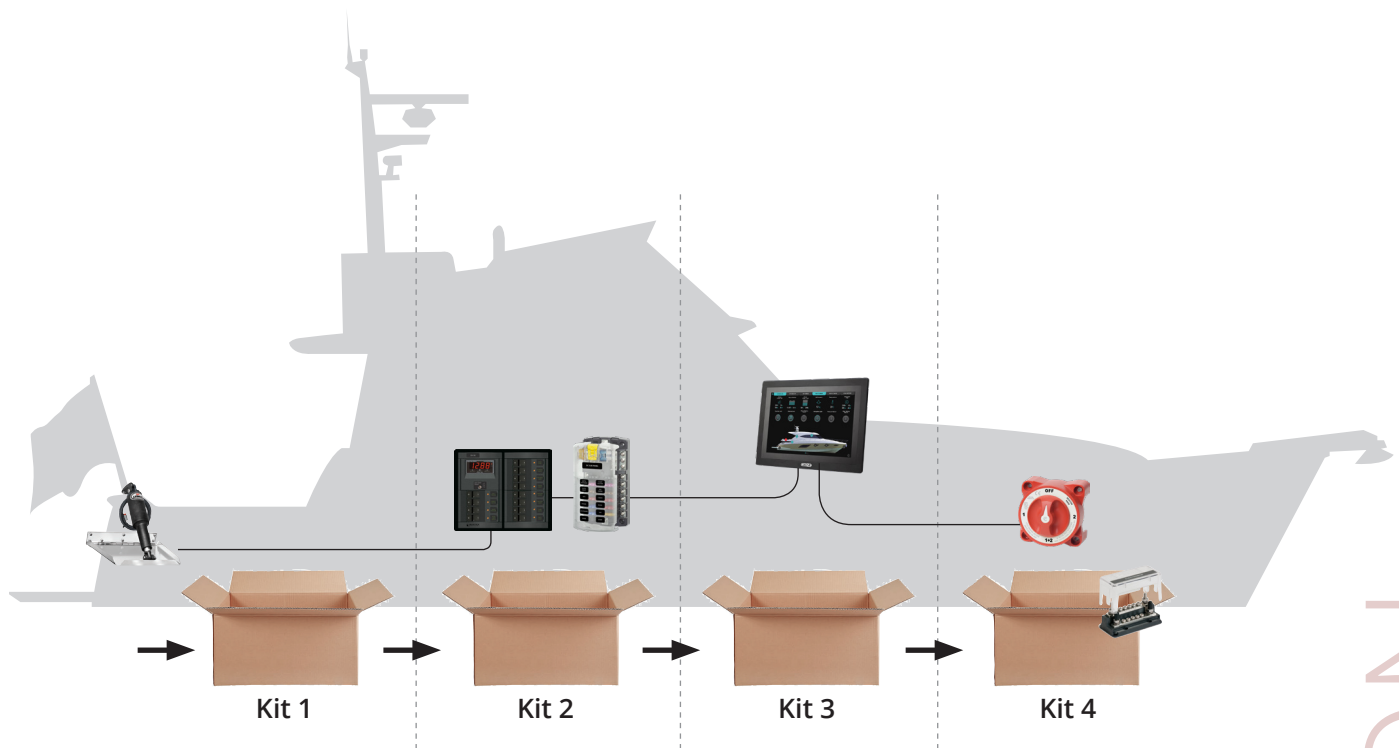
## Harnessing

- Manufacture of pre-fabricated wiring harnesses
- Supplied complete or staged sub-assemblies
- All harnesses clearly labeled for ease of identification



## Custom Kitting (Specifically designed to align with work stations)

- Simplified configuration and installation process
- Reduced error-rates due to categorization and simplicity
- Configuration file developed & installed
- All circuits and backbone harnesses clearly labeled



Labeling examples:

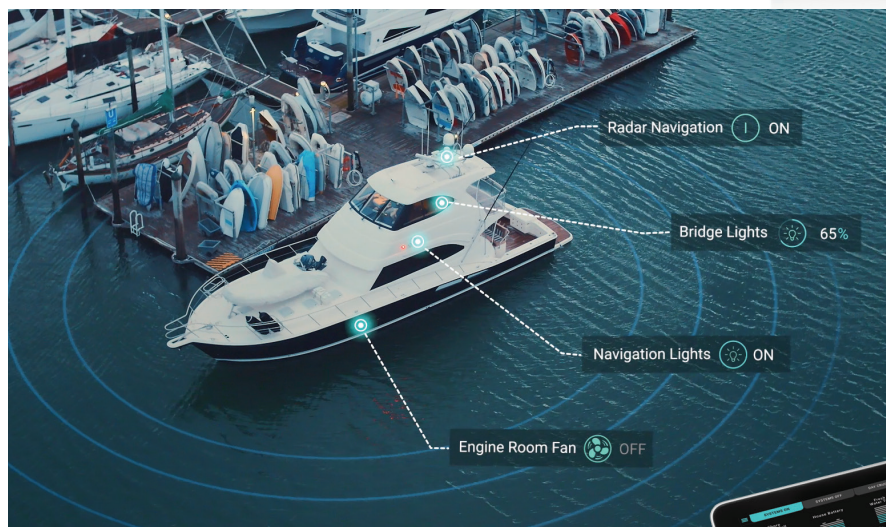
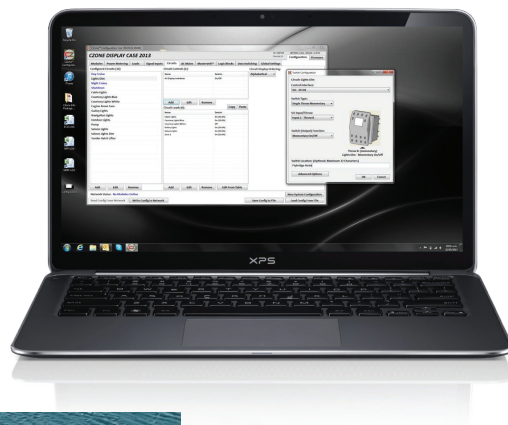


## Configuration

Configuration is the backbone of CZone functionality. It is the code that tells CZone how to perform. It is critical that configuration files are carefully written and input into the system. PPSI will manage all configuration writing and ensure that it is uploaded properly.

### CZone Configuration

- Designed and built for customer specific application
- Defined feature sets and best use of modes



### Marine Modes

Boat Manufacturers can offer a range of predefined modes for the applications and systems built into their vessels. Custom modes can however be programmed to achieve any desired state for the system. Larger vessel systems can be extensive and complex, making it a challenge for many users who simply want to focus on enjoying their time on the water. Modes can ensure critical systems, from bilge pumps to power supply systems, remain operational in the background no matter what the user is doing on-board.



## Commissioning & Support

**Commissioning:** After the electrical system has been designed, built and installed, we will ensure everything is working properly. Our engineers will be on location to confirm functionality, and provide final sign-off on the system.

**Support:** Our global network of system engineers and technical staff are available to offer support for your system when you need it.

- On-site validation of system and configuration files
- Installation illustrations, instruction & assembly tools
- Continued factory support as needed



### Commissioning Report



**Configuration File** CZone COI Suitecase 2016  
**Manufacturer** XYZ Company  
**Model** Big Boat  
**Build Number** 123456  
**Destination** U.S.  
**Inspected By** Mr. Inspector  
**Date Inspected** Wednesday, May 17, 2017  
**Tool Version** R10 (6.11.63.0)

Requirement	Yes/No	Comments
NMEA 2000 network voltage is within acceptable limits? (Minimum 10.5V at any point on the network)	Yes	
All NMEA2000 connections are tight?	Yes	
All NMEA2000 tee's are screwed securely to a flat surface?	Yes	
All NMEA2000 cables have adequate strain relief?	Yes	
All NMEA2000 connections located in wet areas have cables facing downwards?	Yes	Tees are all pointed down
All unused NMEA2000 ports have blanking caps fitted?	Yes	
NMEA2000 network only has T drops, no daisy chains?	Yes	
Terminating resistors fitted to each end of network?	Yes	Only 2 per network.
Modules in wet areas mounted vertically with cable entry facing down?	Yes	
Modules in wet areas installed with all seals and blanking plugs?	Yes	
Have all signal inputs been tested and calibrated?	Yes	
Have all meter inputs been tested and calibrated?	Yes	
Have all circuits been fully tested, including operation from all switches?	Yes	
Is the latest firmware installed?	Yes	R10

#### Notes

Boat tested with all positive results. Boat ready for shipment.

## Notes



PN	Page	PN	Page	PN	Page	PN	Page
1001701	45	80-911-0031-00	42	80-911-0072-00	46	80-911-0155-00	34
1001702	45	80-911-0032-00	43	80-911-0082-00	38	80-911-0156-00	34
1001703	45	80-911-0033-00	43	80-911-0085-01	45	80-911-0160-00	32
1001717	45	80-911-0034-00	43	80-911-0086-01	45	80-911-0162-00	32
1001718	45	80-911-0035-00	43	80-911-0087-01	45	80-911-0163-00	32
80-707-0004-00	47	80-911-0036-00	43	80-911-0088-01	45	80-911-0171-00	32
80-707-0005-00	47	80-911-0037-00	45	80-911-0089-01	45	80-911-0172-00	32
80-911-0005-00	37	80-911-0038-00	45	80-911-0090-00	23	80-911-0174-00	32
80-911-0006-00	37	80-911-0039-00	45	80-911-0095-00	23	80-911-0179-00	32
80-911-0007-00	37	80-911-0040-00	45	80-911-0096-00	38	AC-VSEN-4	47
80-911-0008-00	37	80-911-0041-00	43	80-911-0100-00	18	CT-10-3	47
80-911-0009-00	36	80-911-0042-00	43	80-911-0101-00	18	CT-HD	47
80-911-0010-00	36	80-911-0043-00	43	80-911-0102-00	18	LB-450-50	47
80-911-0011-00	35	80-911-0044-00	24	80-911-0115-00	42	SET-KEYPAD-1	44
80-911-0012-00	35	80-911-0045-00	47	80-911-0116-00	42		
80-911-0013-00	35	80-911-0046-00	42	80-911-0117-00	42		
80-911-0014-00	35	80-911-0047-00	42	80-911-0118-00	42		
80-911-0016-00	43	80-911-0048-00	42	80-911-0119-00	30		
80-911-0017-00	43	80-911-0050-00	42	80-911-0120-00	30		
80-911-0018-00	45	80-911-0051-00	42	80-911-0122-00	28		
80-911-0019-00	45	80-911-0052-00	42	80-911-0123-00	30		
80-911-0020-00	45	80-911-0053-00	42	80-911-0124-00	19		
80-911-0021-00	45	80-911-0054-00	42	80-911-0129-00	30		
80-911-0022-00	45	80-911-0057-00	46	80-911-0131-00	28		
80-911-0023-00	45	80-911-0060-00	45	80-911-0133-00	30		
80-911-0024-00	42	80-911-0061-00	45	80-911-0134-00	31		
80-911-0025-00	42	80-911-0062-00	45	80-911-0135-00	19		
80-911-0026-00	42	80-911-0063-00	45	80-911-0136-00	19		
80-911-0027-00	42	80-911-0066-00	45	80-911-0139-00	34		
80-911-0028-00	42	80-911-0068-00	39	80-911-0140-00	34		
80-911-0029-00	42	80-911-0069-00	38	80-911-0144-00	34		
80-911-0030-00	42	80-911-0071-00	45	80-911-0145-00	34		

## Ingress Protection (IP) Ratings Guide



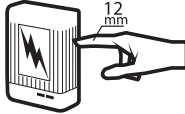
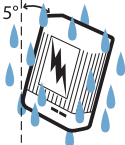
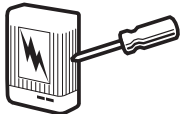



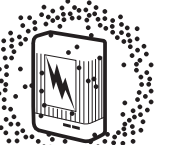





Example:

An IP65 rating can be determined using the adjacent table and example:

- The first number of the rating example, 6, in the gray column means the enclosure is dust tight
- The second number of the rating example, 5, in the blue column means the enclosure is protected against jets of water

The IP rating system was established by the International Electrotechnical Commission (IEC), an organization for international standards and conformity assessment. The IEC collaborates closely with the International Organization for Standardization (ISO). A complete description of the IP ratings and associated tests is found in IEC Publication 529. Although these ratings were initially developed as a way to classify enclosures, they now provide a convenient, practical way to compare levels of sealing. Many electrical products have an Ingress Protection (IP) rating which identifies the environmental factors needing consideration prior to the product's installation.

This is important when deciding when to mount products in a dry and clean environment versus a wet and/or dusty environment. The IP rating indicates the degree of protection provided. The numbers following IP represent levels of sealing and can range from no protection to full protection against dust and water. The table provides a description of the protection at each level.

SOLIDS		WATER	
1	 <p>Protected against a solid object greater than 50 mm such as a hand.</p>	1	 <p>Protected against vertically falling drops of water. Limited ingress permitted.</p>
2	 <p>Protected against a solid object greater than 12 mm such as a finger.</p>	2	 <p>Protected against vertically falling drops of water with enclosure tilted up to 15 degrees from the vertical. Limited ingress permitted.</p>
3	 <p>Protected against a solid object greater than 2.5 mm such as a screwdriver.</p>	3	 <p>Protected against sprays of water up to 60 degrees from the vertical. Limited ingress permitted for three minutes.</p>
4	 <p>Protected against a solid object greater than 1 mm such as a wire.</p>	4	 <p>Protected against water splashed from all directions. Limited ingress permitted.</p>
5	 <p>Dust Protected. Limited ingress of dust permitted. Will not interfere with operation of the equipment. Two to eight hours.</p>	5	 <p>Protected against jets of water. Limited ingress permitted.</p>
6	 <p>Dust tight. No ingress of dust. Two to eight hours.</p>	6	 <p>Water from heavy seas or water projected in powerful jets shall not enter the enclosure in harmful quantities.</p>
		7	 <p>Protection against the effects of immersion in water between 15 cm and 1 m for 30 minutes.</p>
		8	 <p>Protection against the effects of immersion in water under pressure for long periods.</p>

Rating Example:

**IP65**

INGRESS PROTECTION

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