

# Digital Switching

Vessel System Control and Automation



**Raymarine**<sup>®</sup>  
BY **FLIR**

# Digital Switching

## Vessel System Control and Automation

### WHAT IS DIGITAL SWITCHING?

Raymarine Digital Switching brings all of the power and convenience of advanced home automation to your boat. Digital Switching allows you to control onboard electrical and electronic systems like lighting, air-conditioning, navigation lights, wipers, horns, entertainment systems, security systems and much more from your network-connected multifunction displays, smartphone or tablet.

Raymarine Digital Switching replaces the standard mechanical circuit breakers and switches with state-of-the-art digital power distribution. This system not only offers convenience and ease-of-use, it also delivers on the promise of seamless, reliable operation as well as simple and cost-effective installation.



### DIGITAL SWITCHING: ELEGANT SIMPLICITY

Instead of bulky and expensive switch panels, the Raymarine Digital Switching system uses rugged and compact digital Circuit Control Modules (CCMs.) Each CCM can support up to 16 circuits that are customised to meet the exact needs of the equipment being controlled.

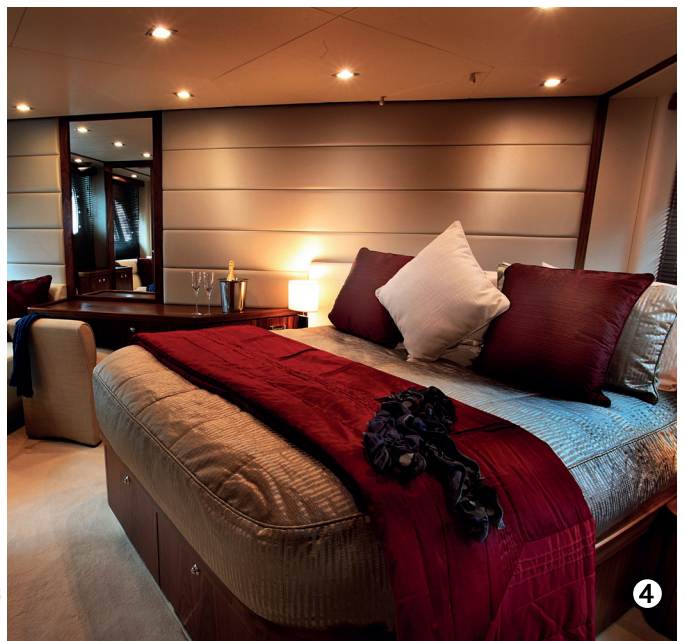
Each CCM connects to the vessel's existing NMEA2000 network backbone enabling it to communicate with the other CCMs and multifunction displays onboard. This flexible network architecture enables the CCMs to be mounted near the equipment they are controlling and therefore reduce the amount of cabling required to be installed onboard the vessel.



This benefits the boat builder and owner by creating a system that is simpler to install and troubleshoot than traditionally switched systems. Significant cost savings can be easily realised due to the faster installation and reduced amount of cable required to wire the vessel's systems.

In addition to wired controls, the Raymarine Digital Switching system also supports ENOcean wireless, energy-harvesting switches and sensors. Completely freed from the constraints of wires, ENOcean wireless devices bring a whole new level of freedom and flexibility to yacht system design.

(1) Navigation electronics and external lighting (2) Gang planks/passereles and bathing platforms (3) Underwater lighting (4) Cabin lighting



# GRAPHICAL INTERFACE



Audio Entertainment



Blinds and Curtains



Wiper Control



LED Lighting



Climate Control



Environment Lighting



Assets for every type of circuit switch or monitor

Fully customisable screens. Assets may be dragged and dropped into any configuration

Screens can be personalised by uploading boat images

# DEVICE CONTROL



## RAYMARINE MULTIFUNCTION DISPLAYS

Control your environment and onboard technology using Raymarine a/c/eSeries displays or gS Series glass bridge displays.



## MOBILE DEVICES

With Raymarine Control and Remote Apps, you can take control using a tablet or smartphone.



Gang Plank/Passerelle



CCTV



Spot Lights



Navigation Lights



Radar



Satellite TV



Thermal Camera

## CONTROL UNITS AND MODULES

### MASTER CONTROL UNIT (MCU)

The Master Control Unit is the central processor that drives the system, providing computing power, intelligence and decision making. In addition, there are various interfaces for connection to external devices and a remote control port.



Master Control Unit installation showing connection of switchable devices

The MCU is a NMEA2000 device that talks to other system components via the NMEA2000 network. The MCU stores and executes configuration files for installation; holding data for every DC Module and Membrane Panel present. Should a Module or Membrane need to be replaced, the MCU distributes data to the replacement once the base address of the new component has been entered.

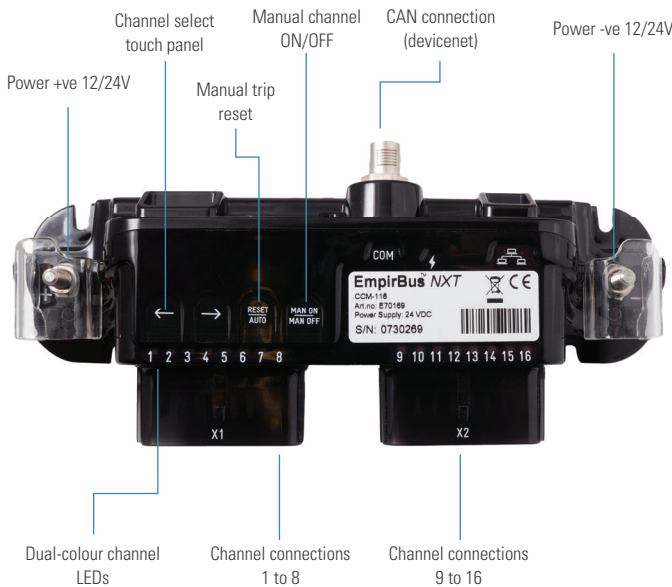






# CCM UNIT DETAILS

Uniquely flexible and configurable, the CCM is able to handle everything required for a modern boat installation:



## OUTPUTS

- Configurable fuse setting up to 18A
- High and low-side options for reversible function
- Dimming function, including soft start/stop
- Under-current circuit detection

## INPUTS

- Configurable thresholds for alarms and/or graphical functions
- Plus or minus sensing for digital
- Analogue inputs for voltage (0-32V), current (4-20mA) or resistive

## MULTIPLEXED CHANNELS

- Up to 4 circuits may be multiplexed into a single channel

## TANK MONITORING

- Calibration with set points

## WINDOW WIPER FUNCTIONS:

- High/low speed, interval etc.

And many more functions, all configurable as per the boat system requirements.



### CIRCUIT CONTROL MODULE (CCM) CHANNEL INFORMATION

	CCM-016	CCM-116	CCM-116W	CCM-216	CCM-216W	CCM-316	CCM-316W	CCM-416	CCM-416W	CCM-516	CCM-516W	CCM-616
Power	12V	12/24V	12/24V	12/24V	12/24V	12/24V	12/24V	12/24V	12/24V	12/24V	12/24V	12/24V
Digital Inputs	16	16	16	16	16	16	16	16	16	16	16	16
Analogue Inputs	16	16	16	16	16	16	16	16	16	16	16	16
Current Inputs										2	2	16
10A Outputs	12	12	12	12	12	12	12	12	12	12	12	12
18A Outputs				4	4	4	4	4	4	4	4	4
Dimmer Outputs	16	16	16	16	16	16	16	16	16	16	16	16
Inverted Outputs	2	2	2	2	2	2	2	6	6	2	2	16
Wiper Control Outputs								4	4			16
Common Ground	2	2	2	2	2	2	2	2	2	2	2	2
Wireless Inputs			30		30		30		30		30	
<b>Part Number</b>	<b>E70296</b>	<b>E70169</b>	<b>E70170</b>	<b>E70171</b>	<b>E70172</b>	<b>E70173</b>	<b>E70174</b>	<b>E70175</b>	<b>E70176</b>	<b>E70177</b>	<b>E70178</b>	<b>E70223</b>

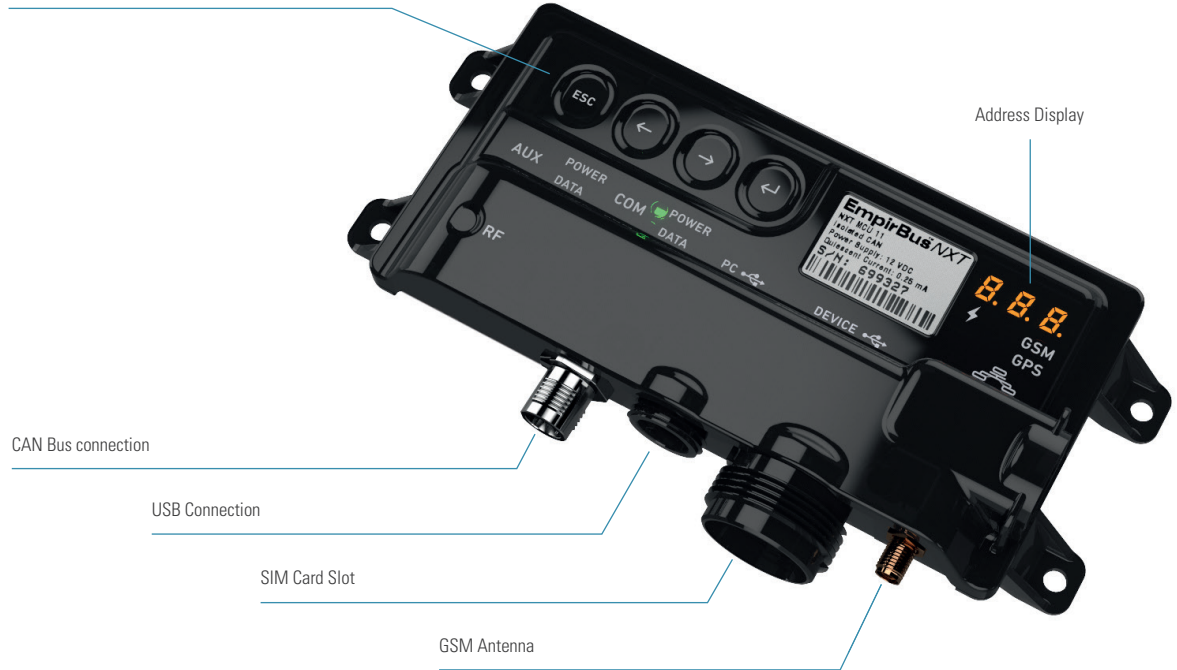
## MCU UNIT DETAILS

The Master Control Unit (MCU) provides numerous benefits to the existing Circuit Control Modules (CCMs):

- In larger systems, the MCU stores the full configuration and ensures effective communication between CCMs.

- The MCU-200 adds GSM capabilities to the system. A dedicated SIM card slot allows the MCU-200 to connect to a mobile GSM network and communicate with a smartphone via text messaging.
- The MCU-150 offers a dedicated CAN-bus link to third-party systems such as air conditioning, battery management etc.

Circuit select touch panel



### Master Control Unit (MCU) Information

	MCU-100	MCU-150	MCU-200 with GSM
Part number	E70179	E70261	E70180

## SWITCH PANEL DETAILS

As an alternative to the touch-screen interface, the 6 x 2 switch panel provides physical operation of connected digital switching circuits. The panel has an onboard buzzer for audible feedback of key-presses, and tri-LED indication for each switch to show circuit status at a glance.



### Switch Panel

6 x 2 Panel

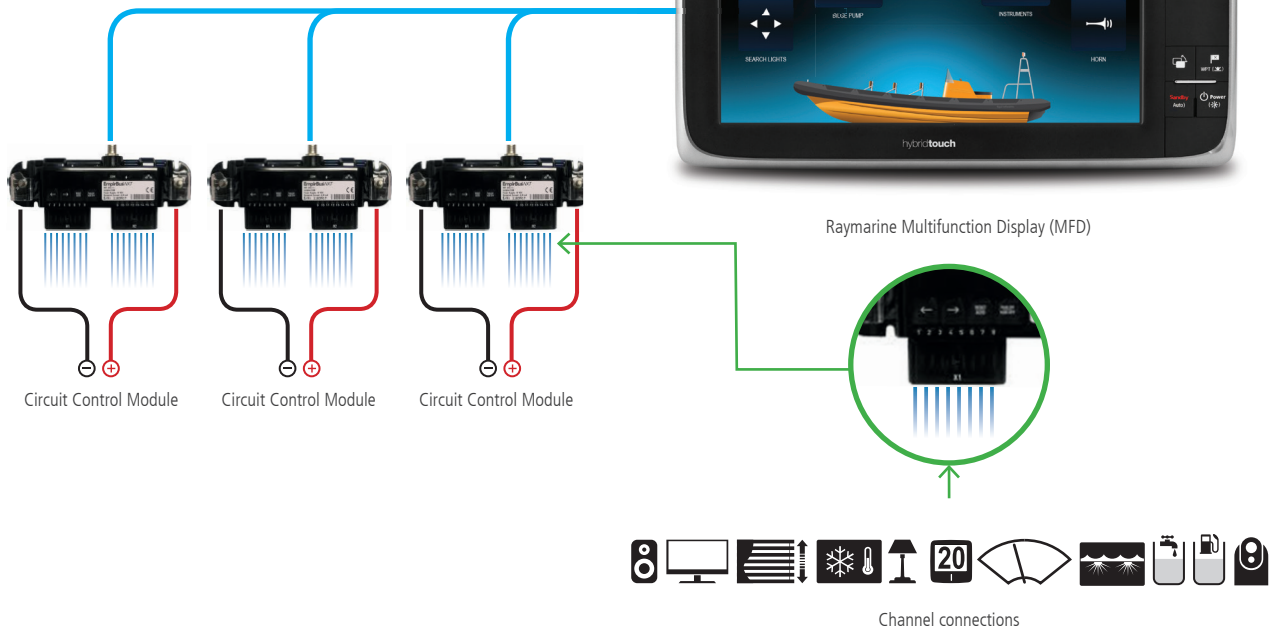
Part number	E70304
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## EmpirBus

Raymarine is proud to partner with Trigent AB and integrate with the EmpirBus NXT distributed power supply system. Based in Uddevalla, Sweden, Trigent has over 10 years of experience developing and deploying ruggedised power distribution systems for marine applications and speciality vehicles. Trigent's power distribution products are used by commercial, industrial and military customers around the world.

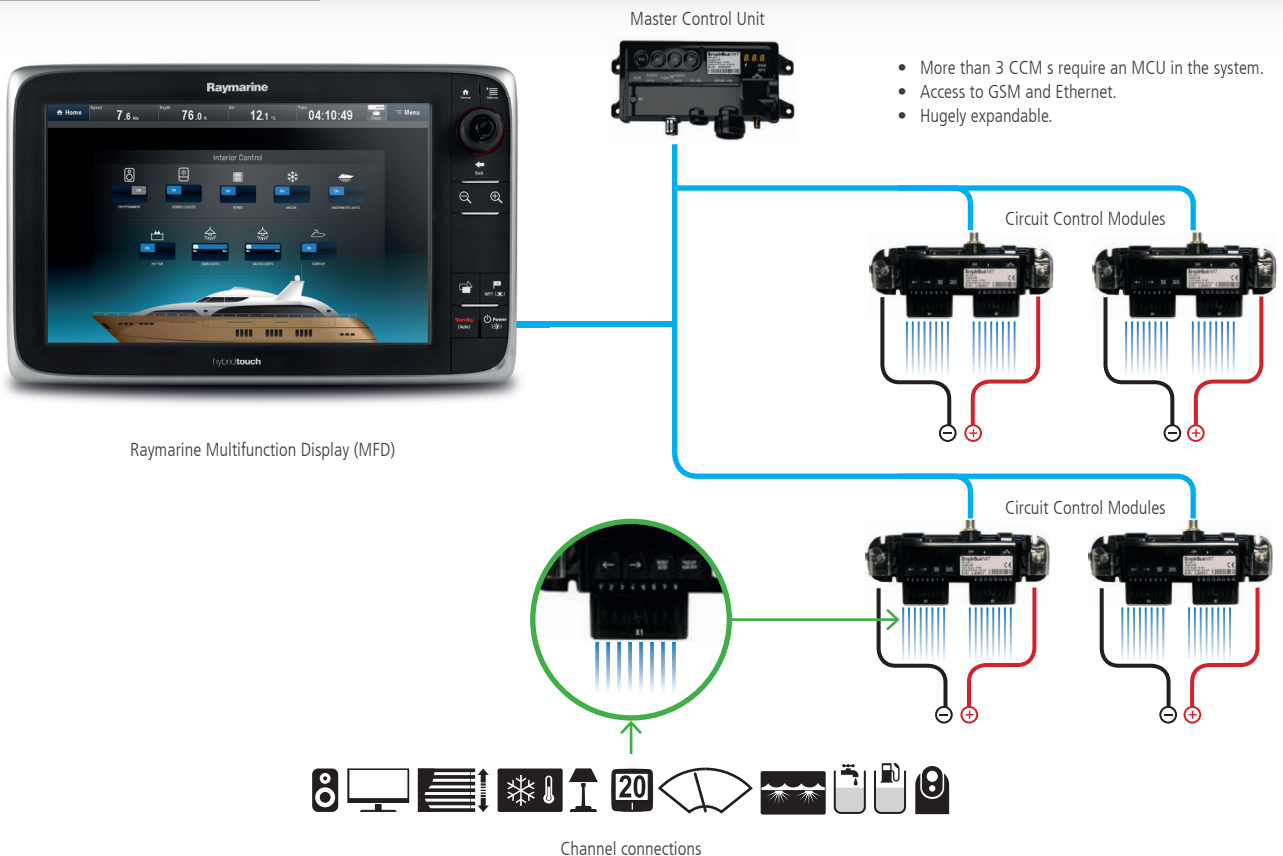
# SIMPLE SYSTEM

- Up to 3 Circuit Control Modules (CCMs) with a total of 48 channels.
- Can be connected directly to Raymarine SeaTalk™ network.
- Each Circuit Control Module requires power.



# EXPANDED SYSTEM

- More than 3 CCM s require an MCU in the system.
- Access to GSM and Ethernet.
- Hugely expandable.



# CONTROLLABLE ITEMS

The diagram below shows a selection of the items you could control using Digital Switching



## CONTENT NOTE

The technical and graphical information contained in this brochure, to the best of our knowledge, was correct as it went to press. However, the Raymarine policy of continuous improvement and updating may change product specifications without prior notice. Therefore, unavoidable differences between the product and this brochure may occur from time to time, for which liability cannot be accepted by Raymarine.

Some images are for illustration purposes only.

**Note:** Equipment described herein may require US Government authorisation for export purposes. Diversion contrary to US law is prohibited.

Photography: Joe McCarthy and SeaRay

UK

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