

CHAPTER 04

Monitoring & digital switching

MARETRON · SIMARINE · GOBIUS



IN THIS CHAPTER

- NMEA 2000 instrumentation
- Tank, fuel & temperature sensors
- DSM displays
- MPower digital switching
- OctoPlex G2 series
- Simarine PICO monitors
- Nereide 2 & VIA displays
- Gobius C tank sensors

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Vessel monitoring & control

MARETRON — THE WORLD-CLASS STANDARD IN NMEA 2000® INSTRUMENTATION · A CARLING TECHNOLOGIES BRAND · TESTED TO IEC 60945

ONE SOURCE FOR THE INTELLIGENT BOAT

The Maretron NMEA 2000® platform

Maretron
Vessel Monitoring & Control



Designed to harness the NMEA 2000® marine networking protocol, Maretron products integrate instrumentation, electronics and boat systems through **one common interface**, scalable for every size of vessel and tested to IEC 60945.

Every Maretron product is NMEA 2000® certified — over 100 tests covering priority messaging, auto-addressing, product information, EMI and noise immunity and electrical isolation.

Product family	What it does	Members
User interface software	Monitor and control every parameter, onboard or ashore	N2KView®, N2KView® Mobile, N2KTracker®
User interface hardware	Displays, touchscreens, black box computers, annunciation	WSV100, TSM810C, MBB300C, DSM410, DSM570, ALM100
Gateways & bridges	Bridge to PC, Internet, J1939 or a second network	USB100, IPG100, J2K100, NBE100
Tank monitoring	Ultrasonic, pressure and resistive tank level	FPM100, TLM100, TLM150, TLA100
Engine monitoring	Engine data, fuel flow, 4-20mA transducer conversion	J2K100, FFM100, CLM100
Electrical monitoring & control	AC and DC monitoring, relays and run indication	ACM100, DCM100, DCR100, RIM100
MPower® digital switching	DC load controllers, bypass, switch modules, keypads	CLMD12, CBMD12, CLMD16, VMM6, CKM12
General systems monitoring	Switch indication, pressure, rudder, temperature, recording	SIM100, FPM100, RAA100, TMP100, VDR100
Navigation instruments	Wind, weather, GPS, heading, depth/speed/temperature	WSO200, GPS200, SSC300, DST110
Cables & connectors	The complete NMEA 2000® approved physical interface	Micro, Mid and Mini systems
Cloud services	Remote monitoring, tracking and asset management ashore	Real Time Cloud, Telemetric Cloud (MCS data plans)
Diagnostics & design software	Design, validate, configure and diagnose the network	N2KMeter®, N2KBuilder®, N2KAnalyzer®, N2KExtractor®

USER INTERFACE HARDWARE AT A GLANCE

Displays, touchscreens & processors

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	Model	Description	Detail
a	WSV100	MConnect® HTML5 web server — real-time pages on phones, tablets, PCs and MFDs	Up to 4 users
b	TSM810C-01	8" vessel monitoring and control touchscreen, direct NMEA 2000® connection	800 × 480, 1350cd/m2
c	MBB300C-01	Third-generation Black Box vessel monitoring and control processor	VGA / HDMI out
d	DSM410-01	4.1" high resolution colour display with dust cover	320 × 240
e	DSM570-01	5.7" high resolution colour display with dust cover	640 × 480
—	ALM100-01	Alarm module — 105 dB annunciator with black cover plate	32 alarm patterns

When manufacturers list products as NMEA 2000 "compatible" or "compliant", the product has not been tested and probably does not meet the stringent safety requirements designed into the NMEA 2000® specification.

Custom Marine specifies, supplies and commissions complete Maretron systems — from a single tank sender to a full N2KView® glass bridge with remote cloud access. Call 800BOATS.

N2KView® monitoring & control software

AWARD-WINNING VESSEL MONITORING AND CONTROL — PC, MOBILE AND DEDICATED HARDWARE

VESSEL MONITORING AND CONTROL SOFTWARE

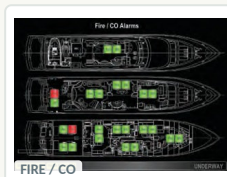
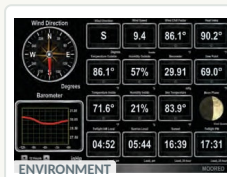
N2KView® for the PC

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Whether monitoring while underway or remotely from home or office, N2KView® displays engines, generators, tanks, rudders, navigation instruments and more — completely user-configurable, with digital displays, analogue gauges, graphic displays, warning lights and bar graphs, and operating limits and colour bands set exactly as you want them.

N2KView® goes beyond simple monitoring with **alerts**, **video**, **switch control**, **anchoring supervision** and **fuel management** — distance and time to empty, fuel rate and fuel economy computed from the flow monitor, tank monitors and GPS.



Part number	Description
N2KView®	N2KView® vessel monitoring and control software for personal computer
N2KView® Additional PC User Add-on	N2KView® software licence for an additional PC user
N2KView® Mobile Android	Free download from the Google Play Store — requires IPG100
N2KView® Mobile Apple	Free download from iTunes — requires IPG100

N2KView® runs on the vessel computer, on the TSM810C touchscreen or on the MBB300C Black Box. To run it on the vessel computer you need either a USB100 or an IPG100 to get sensor information from the NMEA 2000® network to the computer.

WINDOWS PC SERVER / CLIENT

System requirements

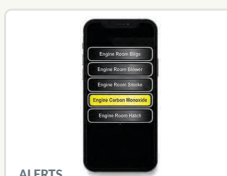
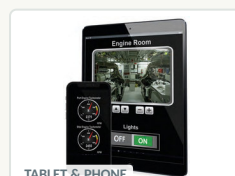
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Parameter	Value	Comment
Operating system	7/8/8.1/10/11	Latest service packs may be required for support
CPU · memory (min / recommended)	Intel Atom / Intel Core i3 · 512MB RAM / 1GB RAM	—
Hard drive · video card (min / recommended)	100 MB · 128 MB / 256 MB	—
USB ports	2.0 or 3.0 compatible	Required to connect through USB100, or to load software from shipped media
Network connections	10/100/1000Base-T or 802.11 b/g/n/ac/ax	Only required if connecting through IPG100 or viewing network-based cameras
Display minimum	800x480 resolution, 32-bit colour	—

SMARTPHONE & TABLET

N2KView® Mobile

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N2KView® Mobile monitors and controls vessel systems from a smartphone or tablet — Android™ 2.2 and higher, Apple iPod, iPhone and iPad. Onboard via Wi-Fi or ashore via an Internet connection.

Screens, layout and the size and type of each parameter are fully configurable: design the screens on a computer with N2KView®, upload them to the **IPG100** and download them to the phone or tablet.

Parameter	Apple iPod, iPhone, iPad	Android
Hardware	iPhone 8 or later · iPad, iPad 2, or later	Any hardware running Android OS
Operating system	iOS 9.0 and above	Android Version 4 and above
Image size · orientation	42.7 MB · portrait or landscape	Varies with device (about 40MB) · portrait or landscape
Connection to N2KServer	Encrypted using SSL encryption	Encrypted using SSL encryption

Cloud services & free PC software tools

REAL TIME CLOUD · TELEMETRIC CLOUD · N2KTRACKER® · N2KBUILDER® · N2KANALYZER® · N2KEXTRACTOR®

REMOTE ACCESS FROM ANYWHERE IN THE WORLD

Maretron Real Time Cloud Service

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As long as there is an Internet connection to the vessel, the **IPG100** automatically logs into the Maretron Real Time Cloud Server and vessel information is made available to any device running N2KView® or N2KView® Mobile — marina Wi-Fi, satellite, GSM or cell modem.

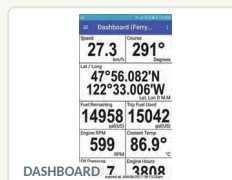
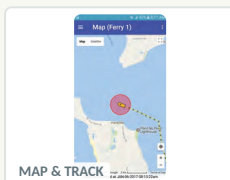
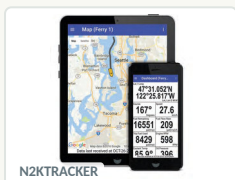
Receive an email or text notification from the vessel, log on from a smartphone, tablet or PC, understand the problem and initiate a corrective action — resetting tripped breakers, starting auxiliary pumps or lights.

Part number	Description
MCS-25GB	Remote vessel monitoring & control data plan — 1 Year Contract Required-25GB/month
MCS-50GB	Remote vessel monitoring & control data plan — 1 Year Contract Required-50GB/month
MCS-100GB	Remote vessel monitoring & control data plan — 1 Year Contract Required-100GB/month

TRACKING & ASSET MANAGEMENT

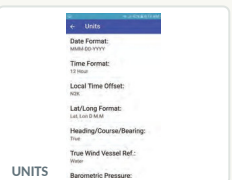
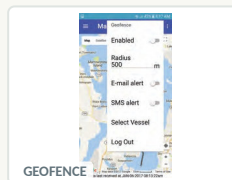
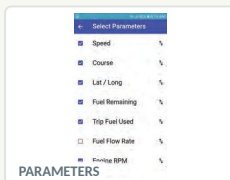
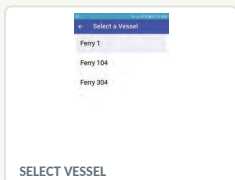
N2KTracker® & Telemetric Cloud Service

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N2KTracker® is a free app showing the boat position and recent track on a Google map. Create, enable and disable a geo-fence so that you or others are alerted if the boat leaves a specified area, with notification by email or SMS text. A dashboard function selects any data stored in the cloud — engine hours, fuel levels, engine parameters or bilge pump runtime.

Telemetric Cloud Service uses the vessel's existing Internet connection to broadcast selected data to the Maretron Cloud Server, where it is stored and accessed ashore. Which data is monitored, and how often it is sent, is set from a TSM810C or MBB300C.

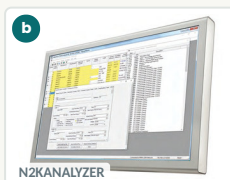
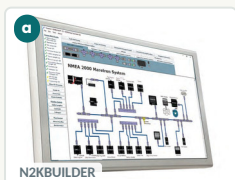


Part number	Description
N2KTracker® Android	Free download from the Google Play Store
N2KTracker® Apple	Free download from iTunes

FREE PC SOFTWARE

Design, analysis & data extraction

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Map out the network design in **N2KBuilder® V3** — plan, document and validate complex NMEA 2000® networks and produce a Bill of Materials for Maretron products directly, eliminating guesswork and transcription errors. It includes an MPower® tab for the CLMD12, CLMD16, CBMD12, VMM6 and CKM12.

	Tool	Function
a	N2KBuilder® V3	Network design — plan, document, validate; produces a Maretron BOM; configuration exports directly to N2KAnalyzer® V3
b	N2KAnalyzer® V3	Detailed view of every device on the network; configuration, updating and troubleshooting. Free with a USB100 or IPG100
c	N2KExtractor®	Extracts VDR100 and Telemetric Cloud data to comma-delimited spreadsheet files. Free with a VDR100

WSV100 MConnect® HTML5 web server

REAL-TIME VESSEL DATA ON ANY BROWSER — PHONES, TABLETS, PCS, MACS AND MFDs, SIMULTANEOUSLY

MCONNECT® — NEW

WSV100 web server

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Designed for vessels of all sizes, the MConnect® Web Server provides real time data on web pages that can be displayed on multiple phones, tablets, PCs or Macs — simultaneously. Following the design paradigm of N2KView®, MConnect's engaging graphic controls make it easy to display a large amount of critical data.

Pages can also be displayed on marine MFDs that support remote HTML servers such as **Garmin OneHelm™** and **Raymarine LightHouse 4**, with full integration of **OctoPlex®** and **MPower®** digital switching. MConnect has direct connections to two NMEA 2000® busses and receives data from both independently — primary and secondary, or independent navigation and monitoring busses, without a bridge.

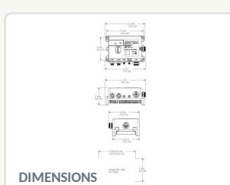
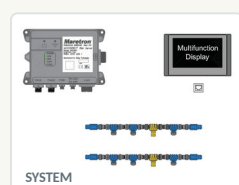
	Part number	Description
a	WSV100	MConnect® HTML5 web server

Product features: IP67 rated · dual CAN bus for single or redundant NMEA 2000® network connections · USB 3.0 port · RJ45 Ethernet port · supports simultaneous access from up to four users · 9–32 V power input, reverse polarity protected · 5 W power usage · engaging HTML5 user interface experience.

SPECIFICATIONS

WSV100 — interfaces, electrical & mechanical

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With multiple simultaneous users and a low price point, MConnect makes comprehensive vessel monitoring available to more users than ever before. Through innovative use of colour and high-definition graphics the health of the boat is displayed at a glance, with information seamlessly rolled up to other screens.

Parameter	Value	Comment
(2) CAN ports	NMEA 2000 Micro-C	For connectivity to NMEA 2000
Serial port	UART interface	Switchable between RS-485 and RS-232 protocols
USB port · RJ45 Ethernet	USB 3.0 · 1Gb/s	Software updates and file uploading · HTTP / HTTPS port
Web browser	HTML5/JavaScript	To support MFD connectivity
Operating voltage · consumption	9–32 V DC · 5 W typical	Dedicated power connection
Operating voltage · consumption	8–32 V DC · 50mA	NMEA 2000 connection — 1 LEN
Reverse polarity protection	Yes	NMEA 2000 & power connection
Overall dimensions (D × W × H)	2.68" × 6.00" × 4.04" (68.18 × 152.61 × 102.70 mm)	Excluding connectors
Weight · mounting	3 lbs (1.36 kg) · screw mount	4 × #10 screw recommended, horizontal or vertical orientation
Material · heat dissipation	ABS plastic front, aluminium back	Aluminium heatsink, air cooled
Temperature · ingress · certification	-20°C to 70°C (storage -40°C to 85°C) · IP67	FCC Part 15 · CE · NMEA 2000

WHAT CONNECTS TO MCONNECT®

Ports & client devices

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Port	Connects to
NMEA 2000® network 1	Primary vessel bus — engines, tanks, batteries, navigation instruments
NMEA 2000® network 2	Secondary or independent monitoring bus, received independently and without a bridge
Ethernet (RJ45, 1Gb/s)	Vessel router — serves HTML5 pages to Android and iOS phones and tablets, PCs, Macs and MFDs
RS-232 or RS-485 network	Switchable UART interface for serial equipment
USB 3.0	Software updates and file uploading

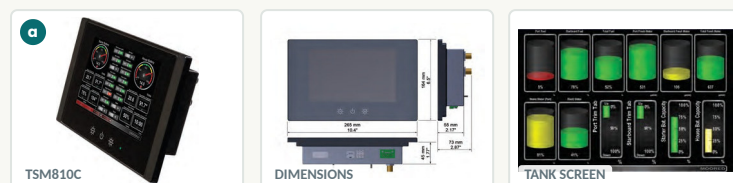
TSM810C 8" monitoring touchscreen

DEDICATED 8" TOUCHSCREEN RUNNING N2KVIEW® VESSEL MONITORING AND CONTROL SOFTWARE

8" VESSEL MONITORING AND CONTROL TOUCHSCREEN

TSM810C

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The TSM810C is an 8" dedicated touchscreen that includes N2KView® vessel monitoring and control software, allowing you to configure as many favourite screens as you want with exactly the information you want to see. It provides an extremely simple touch interface for monitoring and controlling critical systems from anywhere on the vessel.

The TSM810C is ruggedised for marine use and includes a **solid state disk drive** to withstand the pounding associated with waves. Since it dissipates only 10 watts there is no need for internal cooling fans. It can be mounted outside given the high-bright screen and waterproof front, and includes two USB ports for keyboards, mice or trackballs plus an Ethernet port for IP cameras.

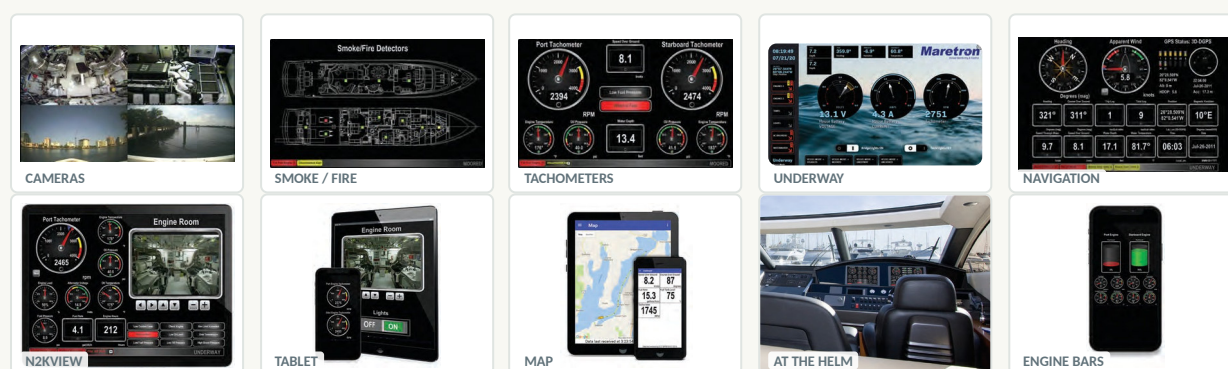
	Part number	Description
a	TSM810C-01	8" vessel monitoring and control touchscreen (direct NMEA 2000® connection)
—	TSM810C-01-Dust-Cover	Replacement dust cover for the TSM810C

Product features: 8" TFT LCD panel, LED backlit · widescreen 5:3 aspect ratio · 800 × 480 pixels · 1350 nits brightness, optically bonded · solid state disk drive · fanless cooling system · flush or VESA mounting · dual CAN bus for single or redundant NMEA 2000® network connections · dust cover included.

SPECIFICATIONS

TSM810C – display, electrical, mechanical & environmental

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Parameter	Value	Comment
Display size · resolution	8" · 800x480 (WVGA)	LED backlit LCD with projected capacitive touchscreen
Brightness · contrast ratio	1350cd/m2 · 600:1	Optically bonded
LCD colour · viewing angle	262K · 80° H, 80° V	—
USB ports	1 × USB 2.0, 1 × USB 3.0	Keyboard, mouse, trackball or thumb drive
Ethernet port	One RJ-45 GbE	IP cameras, email notification alerts, Telemetric Cloud, remote updates
CAN ports	Two waterproof (M12)	Dual NMEA 2000® connection
Operating voltage · power	10–32 V DC · 10 W typ, 15 W max	Dedicated supply connection
Operating voltage · power	8–32 V DC · 50mA	NMEA 2000® connection — LEN 1 (1LEN = 50mA)
Reverse battery · load dump	Yes · Yes	Indefinitely · energy rated per SAE J1113
Overall dimensions (D × W × H)	2.01" × 10.44" × 6.54" (51mm x 265mm x 166mm)	Depth includes NMEA 2000® connectors
Weight · front panel	4.2 lbs (1.9 kg) · glass	Front panel controls: power, brightness +/-
Mounting	4 × M4 VESA 75 × 75 mm, or flush with 6 × M5 × 15 mm screws	VESA screws protrude from the back
Operating · storage temperature	-20°C to 55°C · -30°C to 60°C	Humidity up to 95%
IP rating · approvals	IP66 front, IP22 rear (EN60529)	IEC 60945 · NMEA 2000®

Email notification alerts, Telemetric Cloud Service and remote updates require an active Internet connection.

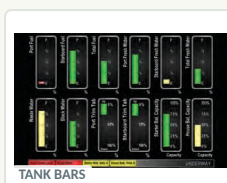
MBB300C Black Box processor

THIRD-GENERATION DEDICATED N2KVIEW® PROCESSING UNIT — SOLID STATE, FANLESS, DUAL CAN BUS

BLACK BOX VESSEL MONITORING AND CONTROL

MBB300C

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The third-generation Black Box MBB300C is a dedicated processing unit that includes N2KView® vessel monitoring and control software. Unlike a PC that allows any software to be loaded, the MBB300C runs only N2KView®, making it extremely stable and dedicated to monitoring and controlling the vessel. The MBB is compatible with **Garmin OneHelm™** and **Raymarine LightHouse**.

The MBB300C connects to a monitor through a VGA or HDMI connector while the associated touchscreen connects through USB/RS232. Alternatives to the touchscreen include keyboards, mice or trackballs connected through USB. It has two completely isolated CAN bus connectors and an Ethernet port for IP cameras.

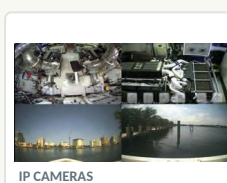
	Part number	Description
a	MBB300C-01	Black Box vessel monitoring and control

Product features: 9–36 V power supply · solid state disk drive · fanless cooling · dual CAN bus for single or redundant NMEA 2000® networks · four USB ports for touchscreen, keyboard, mouse, trackball or thumb drive · VGA or HDMI video connection (2560 × 1600 maximum resolution) · Ethernet connector for IP camera input, email alert notification and Maretron Telemetric Cloud Service.

SPECIFICATIONS

MBB300C – video, interfaces, electrical & mechanical

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Parameter	Value	Comment
Video connector	VGA port · HDMI port	For monitor connection
Monitor resolution	2560 × 1600 maximum (VGA) · 1920 × 1080 maximum (HDMI)	—
USB connector	Two USB 3.0 · two USB 2.0	Peripherals (mouse, keyboard) and/or touchscreen connectivity
Serial connector	One RS232 9-pin D connector	Touchscreen alternative connection — USB/RS232
Touchscreen drivers	TSHARC, 3M MicroTouch, ELO, eGafax, General Touch	Compatible with HID touch compliant panels
Ethernet ports	RJ-45 GbE	IP cameras, email alerts, Telemetric Cloud, remote updates, HTML5 remote
CAN ports	Two NMEA 2000® Micro-C connectors	—
Operating voltage · power	9–36 V DC · 10 W	Dedicated supply connection — maximum
Operating voltage · power	8–32 V DC · 80mA	NMEA 2000® connection — LEN 1, maximum when transmitting 100%
Reverse battery · load dump	Yes · Yes	Indefinitely · energy rated per SAE J1113
Overall dimensions (D × W × H)	5.21" × 8.02" × 1.91" (132.3 × 203.8 × 48.5 mm)	Excluding connectors and wall brackets
Weight · front panel	2.27 lbs (1.03 kg) · aluminium	—
Mounting	4 × M4 VESA 75 × 75 mm	Any orientation
Operating · storage temperature	-20°C to 70°C · -40°C to 85°C	Humidity 10–85% RH non-condensing
Certifications	FCC Class A and CE mark · NMEA 2000®	Electromagnetic compatibility

Email alert notification, Telemetric Cloud Service and remote updates require an active Internet connection.

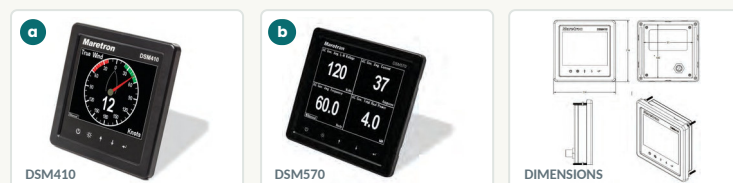
DSM410 & DSM570 colour displays

SUNLIGHT-VIEWABLE COLOUR INSTRUMENT DISPLAYS — IEC 60945 · IP67 ANODIZED ALUMINIUM HOUSINGS

HIGH RESOLUTION COLOUR DISPLAYS

DSM410 4.1" & DSM570 5.7"

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The DSM410 and DSM570 are high-resolution sunlight-viewable colour displays that interpret and display NMEA 2000® instrument, navigation and vessel monitoring data. Both are user-friendly dedicated marine displays with custom screen configurations and an easy-to-use five-key illuminated keypad, an alert/alarm package and electrical switching capability.

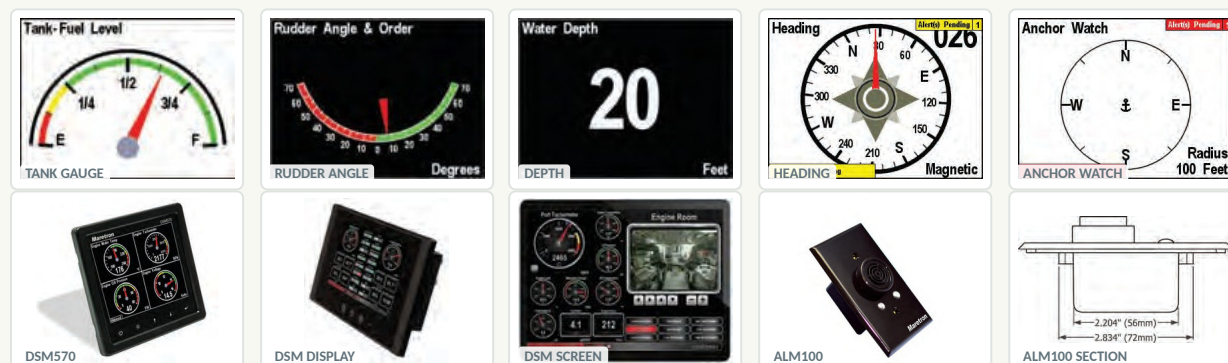
Unlike traditional single-display units, users can choose **numeric, gauge, bar or graph** formats in single or multiple displays with cycling options for a wide range of favourite data. Both connect directly to any NMEA 2000® network and, with the exception of AIS data, will display any or all information captured throughout the vessel.

	Part number	Description
a	DSM410-01	4.1" high resolution colour display with dust cover
—	DSM410-Dust-Cover	Replacement dust cover for the DSM410
b	DSM570-01	5.7" high resolution colour display with dust cover
—	DSM570-Dust-Cover	Replacement dust cover for the DSM570

SPECIFICATIONS

DSM410 vs DSM570

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Parameter	DSM410	DSM570
NMEA 2000® connector	DeviceNet Micro-C	DeviceNet Micro-C
Display technology	Active matrix TFT LCD, sunlight readable	Active matrix TFT LCD, sunlight readable
Display resolution	320 × 240 pixels (QVGA)	640 × 480 pixels (VGA)
Display viewable area	82.56 mm W × 61.92 mm H (4.1" diagonal)	115.2 mm W × 86.4 mm H (5.7" diagonal)
Backlighting	LED, 3 user-programmed levels 0–100%	LED, 3 user-programmed levels 0–100%
Body construction · keyboard	Anodized aluminium · 5 capacitive touch pads, LED backlit	Anodized aluminium · 5 capacitive touch pads, LED backlit
Languages supported	English, Dutch (Nederlands), user selectable	English, Dutch (Nederlands), user selectable
Operating voltage	9 to 30 Volts DC	9 to 30 Volts DC
Power consumption (max) · LEN	250 mA · 1	4.5 W · 9
Reverse battery · load dump	Yes, indefinitely · yes, SAE J1113	Yes, indefinitely · yes, SAE J1113
IEC 60945 class · protection	Exposed · IP67	Exposed · IP67
Operating · storage temperature	-20°C to 70°C · -30°C to 80°C	-20°C to 70°C · -30°C to 80°C
Size (H × W)	4.49" × 4.49" (114mm × 114mm)	5.77" × 6.16" (146.5 × 156.5 mm)
Depth, forward · rear	0.37" (9.5 mm) · 0.81" (20.5 mm)	0.37" (10 mm) · 0.81" (19.9 mm)
Weight · mounting	12.2 oz (346 g) · flush mount	26 oz (737 g) · flush mount

Environmental qualification to IEC 60945: relative humidity 93% RH @ 40°C per IEC60945-8.2 · vibration 2–13.2 Hz @ ±1 mm, 13.2–100 Hz @ 7 m/s² per IEC 60945-8.7 · rain and spray 12.5 mm nozzle @ 100 litres/min from 3 m for 30 min per IEC 60945-8.8 · solar radiation per IEC 60945-8.10 · salt mist 4 × 7 days @ 40°C, 95% RH per IEC 60945-8.12 · emission per IEC60945-9 · immunity per IEC 60945-10 · safety per IEC 60945-12. Certifications: NMEA 2000®, IEC 61162-3, IEC 60945, FCC and CE mark.

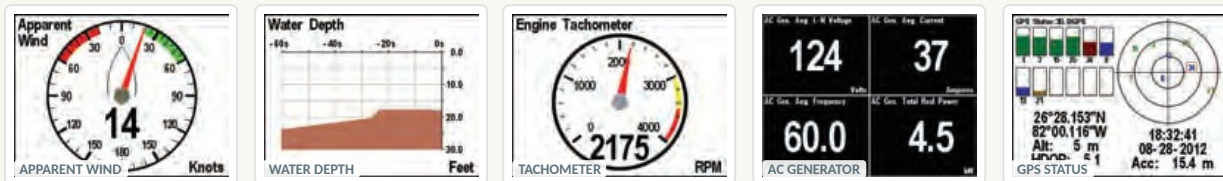
Displayed data types & ALM100 alarm module

WHAT A MARETRON DISPLAY SHOWS — AND HOW THE VESSEL TELLS YOU ABOUT IT

SUPPORTED DATA DISPLAY TYPES

Every parameter on the network

Maretron
Vessel Monitoring & Control

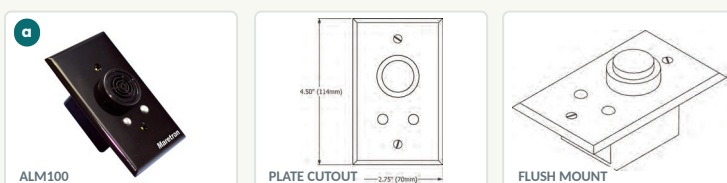


Instrument type	Data types
AC power	Average frequency, average L-N voltage, average L-L voltage, phase A/B/C frequency and L-N voltage, phase AB/BC/CA L-L voltage
Anchor	Watch
DC	Current, voltage, battery temperature, battery state of charge, battery time remaining, ripple voltage, power
Depth	Water depth, water below transducer, transducer offset
Electrical · distribution	Resistance · switch/breaker, breaker current, hardware OFF/ON/ERROR counters, hardware ON/OFF/ERROR timers
Engine monitor	Boost pressure, hours, coolant pressure and temperature, exhaust gas temperature, fuel pressure, fuel rate, oil pressure and temperature, tachometer, tilt/trim, voltage, fuel economy, fuel consumption, percent load, percent torque, trip fuel used, warning indicators
Fluid flow	Flow rate, trip volume
Fuel management	Distance to empty, time to empty, total fuel capacity, total fuel level, total fuel consumption, total trip fuel used, total fuel economy, total fuel rate, total fuel remaining
GPS · heading	COG, lat/lon, SOG, DOP, satellites, time, accuracy · heading, rate of turn, variation
Humidity · indicator	Inside, outside, user defined · status, hardware OFF/ON/ERROR counters and timers
Mechanical · motion	dB, force, strain · acceleration, angle, angular velocity, angular acceleration, distance, rotational rate, velocity
Navigation	BOD, BTW, COG, XTE, DTW, ETA, lat/lon, rolling road, set/drift, SOG, TTG, VMG, waypoint number & name
Pressure / vacuum	Altimeter, barometric, compressed air, engine boost, engine coolant, engine fuel, engine oil, hydraulic oil, steam, transmission oil, user defined, water
Rudder · SMS · speed	Angle & order · status, signal strength, indicator · through water, over ground, total log, trip log
Tanks · temperature	Capacity, level, remaining · bait well, battery, engine coolant, engine oil, engine room, exhaust gas, freezer, heat index, heating system, inside, live well, main cabin, outside, refrigeration, sea, transmission oil, user defined, wind chill
Time · transmission	Local date, UTC date, moon phase, sunrise, sunset, local time, UTC time, twilight AM, twilight PM · gear, oil pressure, oil temperature, warning indicators
Vessel · watermaker	Heave, pitch, roll, trim tabs, keel · Sea Recovery status display

105DB ANYWHERE ON THE VESSEL

ALM100 alarm module

Maretron
Vessel Monitoring & Control



The Alarm Module generates visual and audible alerts for any monitored condition. It includes an extremely loud **105dB SPL piezoelectric sounder** at 2.9 kHz, a red high-brightness LED to indicate an alarm condition and a second green LED to indicate that the module is powered and ready to be triggered. The audible alarm can sound any one of **32 distinct pre-programmed patterns**.

The ALM100 can be triggered by alarms generated by N2KView® or by the DSM Series colour displays. It mounts in a standard single-gang electric box or can be flush mounted on any surface, and is completely waterproof for mounting inside or outside the vessel.

	Part number	Description	Specification
a	ALM100-01	Alarm buzzer with black cover plate	9-32 V DC · 100mA · LEN 2
—	CP-BK-ALM100	ALM100 black cover plate	IP67 · -25°C to 55°C
—	CP-WH-ALM100	ALM100 white cover plate	70 × 114 × 51 mm · 368.5 g

The ALM100 requires configuration if two or more exist on a single network — a Maretron DSM Series display, USB100 or IPG100 is needed to configure them.

NMEA 2000® gateways and bridges

USB100 · IPG100 · J2K100 · NBE100 — PASS INFORMATION OVER DIFFERENT COMMUNICATION PROTOCOLS

THE FAMILY

Four ways off the NMEA 2000® bus

Maretron
Vessel Monitoring & Control



Most Maretron products communicate across an NMEA 2000® network, but there are times when it is appropriate to pass information over different protocols. A PC has no NMEA 2000® connection, so a gateway like the USB100 is used to get information to and from the computer. In addition, Maretron offers a bridge for interconnecting two networks — the **NBE100** — which expands the network beyond the normal limit of 50 products to 100 or even 250, and can build redundant networks where safety is of utmost importance.

	Part number	Description	Size / LEN
a	USB100-01	NMEA 2000® to USB gateway	79 × 88 × 35 mm · LEN 1
b	IPG100-01	NMEA 2000® to Internet Protocol gateway	127 × 114 × 60 mm · LEN 3
c	J2K100-01	J1939 to NMEA 2000® gateway	79 × 88 × 35 mm · LEN 3
—	NBE100-01	NMEA 2000® bridge (network bus extender)	79 × 88 × 35 mm · LEN 3

NMEA 2000® TO USB GATEWAY

USB100

Maretron
Vessel Monitoring & Control



The USB100 bridges computers to an NMEA 2000® network, allowing PC-based vessel monitoring software like N2KView® or PC-based navigation software to be used. One simple connection between network and PC eliminates conventional multiplexers and the maze of wires usually associated with interfacing equipment to PCs. For navigation software that requires NMEA 0183, the USB100 automatically converts NMEA 2000® information into NMEA 0183 sentences.

The USB100 is also used together with **N2KAnalyzer**® software, which lets a PC configure, update and troubleshoot products connected to the network — and save all of the vessel's product configurations so they can be restored if a product needs to be replaced.

	Parameter	Value	Comment
a	Part number	USB100-01	NMEA 2000® to USB gateway
—	NMEA 2000® connector · isolation	DeviceNet Micro-C · opto-isolated	Industry standard waterproof; no electrical connection across bridge
—	USB standard · connector	USB 1.1 · USB type B	Industry standard waterproof
—	USB signals · auxiliary power	D+, D-, +5 V, GND · +5 V < 50mA	Bi-directional gateway
—	USB baud rate	Up to 12 Mb/s	Full speed USB data rate
—	USB interface modes	NMEA 0183 · native NMEA 2000®	Windows drivers supplied; native for N2KView® and N2KAnalyzer®
—	Supported operating systems	Windows XP, Vista, 7, 8, 10 and 11	—
—	Operating voltage · consumption	9 to 32 Volts DC · < 50mA	Average current drain · LEN 1
—	Size · weight	79 × 88 × 35 mm · 8 oz (227 g)	3.11" × 3.46" × 1.38" including flanges for mounting
—	IEC 60945 class · protection	Exposed · IP67	-25°C to 55°C operating, -40°C to 70°C storage

TRANSLATED DATA TYPES

NMEA 2000® to NMEA 0183 through the USB100

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Instrument type	Data types
Battery monitor · compass	Voltage, current, temperature · vessel heading, attitude, rate of turn
Depth	Water depth, transducer offset
Engine	Standard sentences: RPM. Proprietary sentences: boost pressure, tilt/trim, oil pressure, oil temperature, coolant temperature, alternator potential, fuel rate, total engine hours, coolant pressure, fuel pressure
GPS	COG, SOG, DOP, position, satellites, time, date
Rudder indicator · speed	Rudder position · distance log, speed
Weather station · wind	Water temperature · wind direction and speed
Certifications	NMEA 2000® standard Level A · IEC 61162-3 · IEC 60945 · FCC and CE mark for electromagnetic compatibility

IPG100 Internet gateway & NBE100 bridge

REMOTE ACCESS OVER IP · EXTENDING AN NMEA 2000® NETWORK BEYOND ITS DESIGN LIMITS

NMEA 2000® TO INTERNET PROTOCOL GATEWAY

IPG100

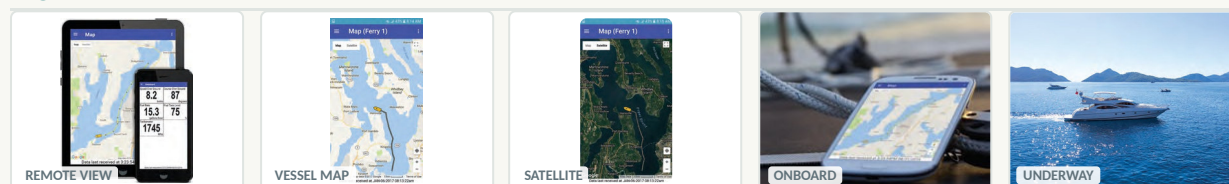
Maretron
Vessel Monitoring & Control



Connect a PC, Mac, tablet or smartphone to the NMEA 2000® network with the IPG100 Internet Protocol Gateway, then monitor and control vessel systems onboard and remotely using N2KView® V3 or the N2KView® Mobile App.

The IPG100 has an NMEA 2000® connector and an Ethernet data port for exchanging information between the onboard network and IP-enabled devices using conventional technology such as routers, switches and wireless modems. Once enabled, the IPG100 automatically connects to Maretron's Real Time Cloud Service (subscription required), allowing remote connection to the vessel over the Internet from anywhere in the world.

	Part number	Description	Specification
	IPG100-01	NMEA 2000® to Internet Protocol gateway	9 to 32 V DC · < 150mA · LEN 3
a	PX0852	USB waterproof cover	Accessory
b	PX0837/5M00	Waterproof Ethernet cable 16.4'	5 m accessory



Size 5,000" × 4,500" × 2,375" (127mm x 114mm x 60mm) · weight 12 oz (340 g) · IEC 60945 exposed · IP67 · -25°C to 55°C operating, -40°C to 70°C storage · reverse battery protected indefinitely · load dump energy rated per SAE J1113. The IPG100 also serves N2KView® Mobile screens designed on a PC and uploaded to the gateway, and passes video from analogue or IP cameras via a video encoder.

NMEA 2000® BRIDGE (NETWORK BUS EXTENDER)

NBE100

Maretron
Vessel Monitoring & Control



The NBE100 lets you go beyond the maximum NMEA 2000® network design rules and extend a network to two, three, four and even five times larger than normal. It also solves problems associated with network errors and other electrical issues caused by exceeding NMEA 2000 rules, and simplifies the design of large networks.

Insert the NBE100 along with the additional termination resistors and powertaps and the network splits into multiple electrical segments, allowing **50 products per segment**. The NBE100 transparently routes messages between segments so they work as a single logical network.

	Part number	Description	Electrical
a	NBE100-01	NMEA 2000® bridge (network bus extender)	9 to 32 V DC · < 150mA · LEN 3

WHAT THE NBE100 CHANGES

Design limits with and without a bridge

Maretron
Vessel Monitoring & Control

NMEA 2000® design rule	Single network	With NBE100 bridges
Maximum number of physical devices	50 products	50 products per electrical segment — 100 or even 250 in total
Maximum trunk (backbone) length	200 metres	Segment the trunk and repeat the limit in each segment
Maximum cumulative drop length	78 metres	78 metres per segment
Electrical isolation	None between devices	Optically isolated segments — increased signal integrity and reliability
PGN filtering	Not available	Specify PGN numbers to be passed or blocked
Redundancy	Not available	Build redundant networks, or isolate a segment so the rest keeps operating

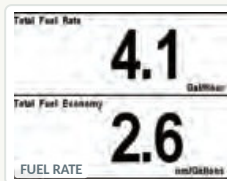
Each NBE100 requires its own termination resistors and powertap on the new segment. All devices continue to operate as if they were still on a single NMEA 2000® network.

J2K100 J1939 to NMEA 2000® gateway

ENGINE, TRANSMISSION AND GENERATOR DATA FROM THE MANUFACTURER'S J1939 BUS ONTO THE VESSEL NETWORK

J1939 TO NMEA 2000® GATEWAY

J2K100 – periodic engine data



The J2K100 translates engine and generator data from the manufacturer's J1939 bus into NMEA 2000® parameter groups, so engine speed, pressures, temperatures, fuel rate, hours and transmission data appear on every Maretron display and in N2KView®.

Electrical 9–32 V DC, < 150mA, LEN 3 · **Mechanical** 79 × 88 × 35 mm, 8 oz (227 g) · **Environmental** IEC 60945 exposed, IP67, -25°C to 55°C.

	Part number	Description
a	J2K100-01	J1939 to NMEA 2000® gateway
—	MCF-2M-D4	J2K100 adapter Micro female to Deutsch 4 pin 2 metre cordset
—	MCF-2M-D12	J2K100 adapter Micro female to Deutsch 12 pin 2 metre cordset
—	MCF-2M-D12CAT	J2K100 adapter Micro female to Deutsch 12 pin 2 T cable

J1939 SPN / PGN	Description	NMEA 2000® PGN
190 / 61444 · 102 / 65270	Engine speed · engine turbocharger boost pressure	127488
100 / 65263	Engine oil pressure	127489
175 / 65262	Engine oil temperature 1	127489
110 / 65262	Engine coolant temperature	127489
167 / 65271	Alternator potential (voltage)	127489
183 / 65266	Engine fuel rate	127489
247 / 65253	Engine total hours of operation	127489
109 / 65263	Engine coolant pressure	127489
94 / 65263	Engine fuel delivery pressure	127489
92 / 61443	Engine percent load at current speed	127489
513 / 61444	Actual engine – percent torque	127489
189 / 65214 · 237 / 65260 · 234 / 65242	Engine rated speed · vehicle identification number · software identification	127498
523 / 61445 · 127 / 65272 · 177 / 65272	Transmission current gear · transmission oil pressure · transmission oil temperature	127493

ALSO TRANSLATED

Generator AC quantities & J1939 diagnostics



J1939 PGN	Description	J1939 PGN	Description
65004	Bus average basic AC quantities	65226	J1939 diagnostic message #1
65005	Utility total AC energy	65227	J1939 diagnostic message #2
65015	Utility total AC reactive power	65228	J1939 diagnostic message #3
65016	Utility total AC power	65229	J1939 diagnostic message #4
65017	Utility average basic AC quantities	65230	J1939 diagnostic message #5
65018	Generator total AC energy	65231	J1939 diagnostic message #6
65028	Generator total AC reactive power	65232	J1939 diagnostic message #8
65029	Generator total AC power	65234	J1939 diagnostic message #10
65030	Generator average basic AC quantities	65235	J1939 diagnostic message #11
130818	Device label (Maretron proprietary)	65236	J1939 diagnostic message #12
130828	Dometic HVAC status	130830	Dometic icemaker status

Response to requested PGNs 126464, 126996, 126998. Protocol PGNs 059392, 059904, 060928, 065240, 126208, 126720.

Tank monitoring & the FPM100

THE MOST COMPREHENSIVE NMEA 2000® TANK TECHNOLOGY IN THE INDUSTRY — FUEL, WATER, WASTE, OIL AND GASOLINE

THE TANK MONITORING FAMILY

Four ways to measure a tank

Maretron
Vessel Monitoring & Control



Whether retrofitting a tank with an existing resistive sensor, or measuring precision tank level even when heeled over during sailing or riding bow up on plane, there is a Maretron product for the application.

	Model	Application	Sensing method
a	FPM100	Fluid pressure monitor — deep tanks, tanks with internal structure, pressures and vacuum	Up to six pressure transducers
b	TLM100	Tank level monitor, max 40" depth — diesel, fresh water, waste, black water and oil	Ultrasonic, non-contact
c	TLM150	Tank level monitor for gasoline tanks, up to 24" (0.61 m) depth	Ultrasonic, non-contact
d	TLA100	Tank level adapter — adapts existing resistive tank senders	Resistive, 0–300 ohms

All Maretron tank monitors can be custom calibrated for oddly shaped tanks and programmed with the tank capacity, so that multiple tanks can be combined into a single total tank gauge. Combined with the fuel flow monitor and GPS speed they produce trip parameters such as distance and time to empty.

FLUID PRESSURE MONITOR

FPM100 & pressure transducers

Maretron
Vessel Monitoring & Control



The FPM100 interfaces up to six pressure transducers to the NMEA 2000® network (transducers sold separately), reporting either pressure or vacuum for water, oil and hydraulic pressures or system vacuum for detecting clogged filters. A **tank level mode** monitors fluid level through a transducer at the bottom of the tank — for tanks that are extremely deep, have internal structures, or are otherwise unsuited to other level sensing technologies.

	Part number	Description		Part number	Description
a	FPM100-01	Fluid pressure monitor	—	PT-0-500PSI-01	Pressure transducer 0 to 500 PSI
b	PT-0-1.5PSI-01	Pressure transducer 0 to 1.5 PSI	—	PT-0-1000PSI-01	Pressure transducer 0 to 1000 PSI
—	PT-0-3PSI-01	Pressure transducer 0 to 3 PSI	—	PT-0-5000PSI-01	Pressure transducer 0 to 5000 PSI
—	PT-0-5PSI-01	Pressure transducer 0 to 5 PSI	—	PT-SNUB-01	Pressure snubber
—	PT-0-10PSI-01	Pressure transducer 0 to 10 PSI	—	PT-V-0-1BAR-01	Pressure transducer vacuum to 1 Bar
—	PT-0-50PSI-01	Pressure transducer 0 to 50 PSI	c	PTS-0-1.5PSI-01	Submersible pressure transducer 0 to 1.5 PSI
—	PT-0-100PSI-01	Pressure transducer 0 to 100 PSI	—	PTS-0-3.0PSI-01	Submersible pressure transducer 0 to 3.0 PSI
—	PT-0-300PSI-01	Pressure transducer 0 to 300 PSI	—	PTS-0-5PSI-01	Submersible pressure transducer 0 to 5 PSI

Each FPM100 channel is independently programmable to match the transducer characteristic and to work in pressure/vacuum mode or tank level mode.

PRESSURE SOURCE TYPES

What the FPM100 reports

Maretron
Vessel Monitoring & Control



Twenty-one pressure source types are selectable per channel — water, atmospheric, compressed air, hydraulic and steam pressure plus 16 user-defined sources. **Accuracy** ±1% FS exclusive of transducer • **resolution** ±0.33% FS • **electrical** 9 to 32 V DC, 400 mA, LEN 8 • 88.9 × 106.7 × 51.6 mm, 368.5 g, IP64.

PGN	PGN name	Group
127505 • 130314 • 130840	Fluid level • actual pressure • generic sensor (Maretron proprietary)	Periodic data PGNs
126464 • 126996 • 126998	PGN list • product information • configuration information	Response to requested
059392 • 059904 • 060928 • 065240 • 126208	ISO acknowledge • ISO request • ISO address claim • ISO address command • NMEA request/command/acknowledge	Protocol PGNs
126720 • 130818	Device configuration information • device label	Maretron proprietary

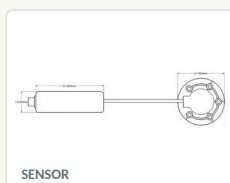
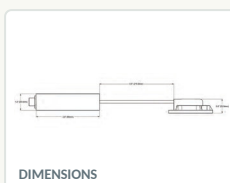
TLM100 & TLM150 ultrasonic tank monitors

NO PROBES IN THE TANK — ULTRASONIC TIME-OF-FLIGHT LEVEL SENSING OVER NMEA 2000®

TANK LEVEL MONITOR — 40" MAX DEPTH

TLM100

Maretron
Vessel Monitoring & Control



The TLM100 senses fluid levels using ultrasonic technology: sound waves are transmitted from the monitor mounted at the top of the tank and the flight times to and from the fluid are measured, much like a depth sensor. There are no difficult-to-handle long probes protruding into the tank to foul or corrode.

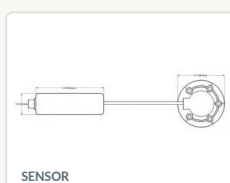
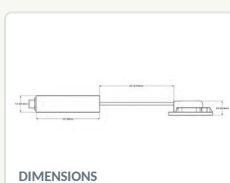
It senses tanks up to 40" (1.02 m) deep for diesel, fresh water, waste water, black water and oil (see TLM150 for gasoline, or FPM100 for deeper tanks) and mounts to the industry standard SAE J1810 5-hole pattern, or to threaded openings using the optional adapters.

	Part number	Description
a	TLM100-01	Tank level monitor (40" max depth)
—	TA-5H-1.25BSP	1.25" BSP displacement hull tank adapter
—	TA-5H-1.5NPT	1.5" NPT displacement hull tank adapter
—	TFT-5H	SAE 5-bolt pattern non-displacement hull focus tube
—	TFT-1.25BSP	1.25" BSP non-displacement hull focus tube
—	TFT-1.5NPT	1.5" NPT non-displacement hull focus tube
—	TFTDBE-5H	5-bolt pattern focus tube with dead band eliminator

TANK LEVEL MONITOR — GASOLINE

TLM150

Maretron
Vessel Monitoring & Control



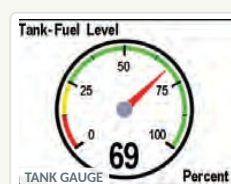
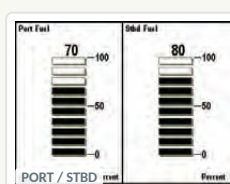
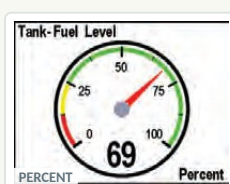
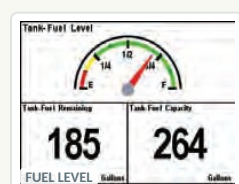
The TLM150 senses **gasoline** fluid levels using the same ultrasonic technology, in tanks up to 24" (0.61 m) in depth. Like the TLM100 it can be calibrated for irregular tank shapes so that you know the true fluid level, and it mounts directly to the top of tanks using the SAE J1810 5-hole pattern or the optional 1.5" NPT and 1.25" BSP adapters.

	Part number	Description
a	TLM150-01	Tank level monitor (24" depth gasoline tanks)
—	TA-5H-1.25BSP	1.25" BSP displacement hull tank adapter
—	TA-5H-1.5NPT	1.5" NPT displacement hull tank adapter
—	TFT-5H	SAE 5-bolt pattern non-displacement hull focus tube
—	TFT-1.25BSP	1.25" BSP non-displacement hull focus tube
—	TFT-1.5NPT	1.5" NPT non-displacement hull focus tube
—	TFTDBE-5H	5-bolt pattern focus tube with dead band eliminator

ON ANY MARETRON DISPLAY

How tank data is presented

Maretron
Vessel Monitoring & Control



PGN	PGN name	Default rate
127505	Fluid level	Periodic data PGN
126464	PGN list (transmit and receive)	Response to requested PGN
126996 • 126998	Product information • configuration information	Response to requested PGN

TLA100 & RAA100 resistive sender adapters

BRING EXISTING RESISTIVE SENDERS ONTO THE NETWORK WITHOUT GIVING UP THE ANALOGUE GAUGES

SPECIFICATIONS

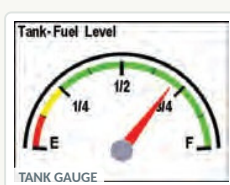
TLM100 & TLM150 – common data



Parameter	Value	Comment
Accuracy · resolution	±2% · ±1%	—
Number of tank types	16	Fuel, fresh water, waste water, live well, oil, etc.
Number of tanks per tank type	16	16 tanks per tank type, numbered 0–15
Maximum tank depth	40" (1.02 m) TLM100 · 24" (0.61 m) TLM150	Minimum depth reading 2" (5.08 cm) sensor deadband
Irregularly shaped tanks	Yes	Can be calibrated for any shape tank
Programmable tank capacity	Yes	Allows displays to calculate amount remaining
Maximum tank angle	6° without focus tube · 15° with focus tube	—
Operating voltage · consumption	9 to 16 Volts · < 100mA	LEN 2 (1LEN = 50mA)
Size — interface component	3.9" × 1.2" × 1.0" (99 × 30.5 × 25.4 mm)	Sensor 2.7" dia × 0.9" (68.6 mm dia × 22.9 mm)
Interconnecting cable · weight	8.5" (215.9 mm) · 12 oz (340 g)	Mounting: SAE J1810 5-hole bolt pattern
IEC 60945 class · protection	Exposed · IP67	-25°C to 55°C operating, -40°C to 70°C storage
Relative humidity · vibration	93% RH @ 40°C · 2–13.2 Hz @ ±1 mm, 13.2–100 Hz @ 7 m/s ²	Per IEC60945-8.2 and IEC 60945-8.7
Solar radiation · salt mist	Ultraviolet B, A, visible and infrared · 4 × 7 days @ 40°C, 95% RH	Per IEC 60945-8.10 and IEC 60945-8.12 after 2 hour salt spray
Emission · immunity · safety	Conducted and radiated · conducted, radiated, supply and ESD	Per IEC 60945-9, IEC 60945-10 and IEC 60945-12
Certifications	NMEA 2000® Level A · IEC 61162-3 · IEC 60945 · FCC and CE mark	Electromagnetic compatibility

TANK LEVEL ADAPTER

TLA100



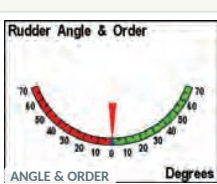
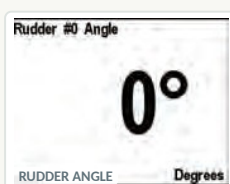
The TLA100 adapts commercially available resistive tank senders to the NMEA 2000® network. It is compatible with both the American standard (240-30 ohm) and the European standard (10-180 ohm) resistive senders, and can be calibrated for any resistance between 0-300 ohms. It works alongside analogue gauges at the same time as NMEA 2000®, so existing gauges do not have to be given up, and can equally be used standalone.

	Part number	Description	Electrical & mechanical
a	TLA100-01	Tank level adapter	9 to 16 V · < 100mA · LEN 2 · 99 × 30.5 × 25.4 mm · 9 oz (255 g) · IP67

Product features: NMEA 2000® interface · adapts American standard (240-30 ohm) and European standard (10-180 ohm) resistive senders · user calibrated for any resistance range from 0-300 ohms or 300-0 ohms · accommodates irregularly shaped tanks with 16-point calibration · 16 programmable tank types including fuel, fresh water, waste water and live well · programmable tank number up to 16 per tank type · programmable tank capacity · works alongside analogue gauges · can be used standalone.

RUDDER ANGLE ADAPTER

RAA100



The RAA100 adapts commercially available resistive rudder senders to the NMEA 2000® network, so rudder angle can be observed anywhere on the vessel where there is a compatible display. Like the TLA100 it accepts both American (240-30 ohm) and European (10-180 ohm) standards and can be calibrated for any resistance from 0-300 ohms. **Three point electronic calibration** eliminates the need for mechanical adjustment.

	Part number	Description	Electrical & mechanical
a	RAA100-01	Rudder angle adapter	9 to 16 V · < 50mA · LEN 1 · 99 × 30 × 25 mm · 9 oz (255 g) · IP67

RAA100 PGNs: 127245 rudder (periodic). Response to requested PGNs 126464, 126996, 126998. Protocol PGNs 059392, 059904, 060928, 065240, 126208. Maretron proprietary 126720 device configuration information and 130818 device label.

Engine monitoring & the FFM100

PRECISION FUEL FLOW, ENGINE DATA AND 4-20MA CONVERSION — J2K100 · FFM100 · CLM100

THE ENGINE MONITORING FAMILY

Three products, one network

Maretron
 Vessel Monitoring & Control


Engines are one of the more important systems on a vessel and monitoring them is essential for safe, trouble-free passages. Maretron engine monitoring products communicate critical information like oil pressure and coolant temperature, giving early warning of problems. Programmable alerts can be set for any parameter, and state-of-the-art fuel flow monitoring finds the vessel's optimum running points for substantial fuel savings.

	Model	What it does	Electrical
a	J2K100-01	J1939 to NMEA 2000® gateway — engine, transmission and generator data	9-32 V · < 150mA · LEN 3
b	FFM100-01	Fuel/fluid flow monitor — positive displacement metering with temperature compensation	9-32 V · 150mA · LEN 3
c	CLM100-01	Current loop monitor — converts 4-20mA transducers to network data	9-32 V · 400mA · LEN 8

FUEL / FLUID FLOW MONITORING

FFM100 & flow senders

Maretron
 Vessel Monitoring & Control

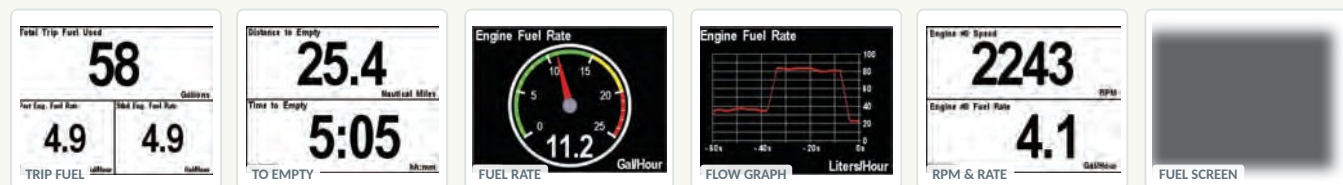

The FFM100 provides precision fuel flow information to help optimise fuel consumption. It uses **positive displacement metering** for unprecedented accuracy and eliminates flow conditioning components such as straighteners and pulsation dampers.

True temperature compensation corrects for returning fuel hotter than supply fuel, where inaccuracies of as much as 5% can otherwise occur, and the FFM100 detects momentary reverse flow caused by the injection pump. It can be used for fluids other than fuel by ordering the appropriate flow sender.

	Part number	Description	Range
a	FFM100-01	Fuel flow monitor	—
b	M1AR	Fuel flow sensor	2-100 LPH (0.53-26.4 GPH)
c	M2AR	Fuel flow sensor	25-500 LPH (6.6-132 GPH)
—	M4AR	Fuel flow sensor	180-1500 LPH (48-396 GPH)
—	M8AR	Fuel flow sensor	8-70 LPM (2.1-18.5 GPM)
—	M16AR	Fuel flow sensor	10-100 LPM (2.6-26.4 GPM)

SPECIFICATIONS

FFM100 — accuracy, electrical & mechanical

Maretron
 Vessel Monitoring & Control


Parameter	Value	Comment
Accuracy · resolution	±1.75% differential mode · ±0.25% two independent sensors · 0.1 LPH (0.026 GPH)	K factors programmed into FFM100; 4:1 fuel feed / fuel consumption ratio
Operating voltage · consumption	9 to 32 Volts · 150mA	LEN 3 · reverse battery and load dump protected
Size · weight · protection	88.9 × 106.7 × 51.6 mm · 368.5 g · IEC 60945 exposed, IP64	Including flanges for mounting; -25°C to 55°C operating, -40°C to 70°C storage
PGNs transmitted	127489 · 127497 · 065286 · 065287 · 130818	Engine parameters dynamic · trip parameters engine · fluid flow rate · trip volume · device label
Flow sender ordering	Ordered separately per application	Single sender for a gas engine, dual senders for a diesel engine, water flow sender for sea water; senders pass particles up to 70 micrometres

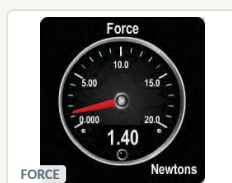
CLM100 current loop monitor

ANY 4-20mA TRANSDUCER ON THE VESSEL, CONVERTED TO NMEA 2000® DIGITAL DATA

4-20mA CURRENT LOOP MONITOR

CLM100

Maretron
Vessel Monitoring & Control



The CLM100 converts commercially available 4-20mA current loop transducers into digital data so a wide variety of information can be displayed on Maretron displays — DC voltage and current, flow rate, distance, linear velocity and acceleration, angle, angular velocity and acceleration, temperature, humidity, resistance, strain gauges, force (load cell), pressure, decibels and rotational rate.

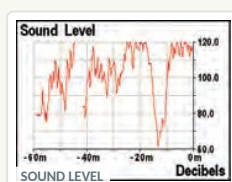
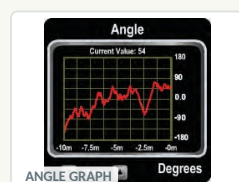
Typical applications include **machinery monitoring** using accelerometers and vibration sensors on pumps, motors, fans, compressors and gear boxes for early warning of problems; **shaft speed monitoring** with a rotational rate transducer coupled to the shaft; and **load monitoring** using clevis pins with a 4-20mA interface on a mast stay or tow attachment point.

	Part number	Description		Part number	Description
a	CLM100-01	Current loop monitor	—	PT-0-100PSI-01	Pressure transducer 0 to 100 PSI
—	IRHT-01	Indoor humidity/temperature sensor	—	PT-0-500PSI-01	Pressure transducer 0 to 500 PSI
—	PT-0-1.5PSI-01	Pressure transducer 0 to 1.5 PSI	—	PT-0-1000PSI-01	Pressure transducer 0 to 1000 PSI
—	PT-0-3PSI-01	Pressure transducer 0 to 3 PSI	—	PT-0-5000PSI-01	Pressure transducer 0 to 5000 PSI
—	PT-0-5PSI-01	Pressure transducer 0 to 5 PSI	—	PT-SNUB-01	Pressure snubber
—	PT-0-10PSI-01	Pressure transducer 0 to 10 PSI	—	PT-V-0-1BAR-01	Pressure transducer vacuum to 1 Bar
—	PT-0-50PSI-01	Pressure transducer 0 to 50 PSI	—	PTS-0-1.5PSI-01	Submersible pressure transducer 0 to 1.5 PSI
—	PTS-0-3PSI-01	Submersible pressure transducer 0 to 3 PSI	—	PTS-0-5PSI-01	Submersible pressure transducer 0 to 5 PSI

SPECIFICATIONS

CLM100 — channels, accuracy & environmental

Maretron
Vessel Monitoring & Control



Six channels, each independently programmable for a different operating mode, with the transducer excitation supplied by the CLM100 itself. The same module is listed again in the general systems monitoring section of the Maretron catalogue.

Parameter	Value	Comment
Number of channels	6	Independently programmable
Operating modes	17 modes	DC voltage, DC current, flow rate, distance, linear velocity, linear acceleration, angle, angular velocity, angular acceleration, temperature, humidity, resistance, strain gauge, force (load cell), pressure, decibels, rotational rate
Transducer interface	4-20mA current loop	Current loop excitation voltage 12-15 VDC
Accuracy · resolution	±1% FS · ±0.33% FS	Exclusive of transducer · over full transducer range
Operating voltage · consumption	9 to 32 Volts · 400mA	LEN 8 · reverse battery and load dump protected
Size · weight	88.9 × 106.7 × 51.6 mm · 368.5 g	3.50" × 4.20" × 2.03" including flanges for mounting
IEC 60945 class · protection	Exposed · IP64	-25°C to 55°C operating, -40°C to 70°C storage
PGNs transmitted	127488 · 127489 · 127493 · 127508 · 127751	Engine parameters rapid and dynamic · transmission parameters · battery status · DC voltage/current
Maretron proprietary PGNs	126720 · 130818 · 130840	Device configuration information · device label · generic sensor

ACM100 & DCM100 electrical monitors

SHORE POWER, GENERATORS AND INVERTERS · BATTERIES, ALTERNATORS, SOLAR AND WIND

THE ELECTRICAL MONITORING FAMILY

ACM100 · DCM100 · DCR100 · RIM100

Maretron
Vessel Monitoring & Control



Maretron offers the widest variety of NMEA 2000® electrical monitoring and control products in the industry — for AC systems (shore power, generators, inverters) and for DC systems (batteries, solar panels, wind power) — plus solid state relays for controlling DC loads and run indication for knowing exactly when equipment is, or is not, running.

	Model	What it does	Electrical
a	ACM100-01	Alternating current monitor — single, split or 3-phase AC sources and busses	9–32 V · 50mA · LEN 1
b	DCM100-01	Direct current monitor — voltage, current, state of charge and time remaining	9–32 V · 70mA · LEN 1
c	DCR100-01	Direct current relay module — six 10 A relays with current monitoring	9–32 V · 150mA · LEN 3
d	RIM100-01	Run indicator module — six AC or DC circuits, with timers and counters	9–32 V · 50mA · LEN 1

ALTERNATING CURRENT MONITOR

ACM100 & AC transducers

Maretron
Vessel Monitoring & Control



The ACM100 monitors AC power sources and outputs the information onto the NMEA 2000® network, **opto-isolated** to eliminate ground loops, with waterproof connectors and a sealed enclosure. Bus monitoring transmits voltage and frequency; source monitoring transmits voltage, current, frequency, real, reactive and apparent power, power factor and total energy imported and exported.

	Part number	Description	Specification
	ACM100-01	Alternating current (AC) monitor with 100 Amp AC transducer	0-380 VAC line-to-neutral · ±1% · 30-80Hz
a	M000630	100 Amp AC transducer with cable	Included with ACM100-01
b	M000612	400 Amp AC transducer with cable	Optional, 0 to 400 A range

Supported AC systems: single phase 120, 208, 230, 240 · split phase 120/240 · 3-phase delta 208, 230, 400, 480, 600 · 3-phase wye 208Y/120, 400Y/230, 415Y/240, 480Y/277, 600Y/347 · delta with wild phase 120/208/240 · corner grounded delta 120/208/240. Size 88.9 x 106.7 x 51.6mm, 368.5 g, IP64, -25°C to 55°C.

DIRECT CURRENT MONITOR

DCM100 & current transducers

Maretron
Vessel Monitoring & Control



The DCM100 measures the voltage and current of any DC power source or load — batteries, alternators, solar panels, wind generators, inverters, windlasses, DC refrigerators or any DC branch circuit. When monitoring batteries, sophisticated algorithms use battery temperature, load current, charging current and terminal voltage to compute **state of charge** and **time remaining**. Current is measured with an included Hall-effect sensor that simply slips over the wire — no broken connections or inline shunts.

	Part number	Description
a	DCM100-01	Direct current (DC) monitor with 200 Amp current transducer (includes FC01, LEMHTA200-S and TR3K)
c	FC01	DCM100 battery harness with fuse
b	LEMHTA200-S	200 Amp current transducer with cable
—	LEMHTA400-S	400 Amp current transducer with cable
—	LEMHTA600-S	600 Amp current transducer with cable
—	TR3K	DCM100 ring / under bolt temperature probe

Monitored: battery voltage, current, ripple voltage, case temperature, state of charge, time remaining, charge efficiency factor. Sense range 0–50 V DC ±100 mV; current 0–200 A ±1%. PGNs 127506, 127508, 127513.

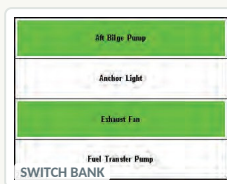
DCR100 relay module & RIM100 run indicator

SWITCH SIX DC LOADS FROM ANYWHERE ONBOARD · KNOW EXACTLY WHEN EQUIPMENT IS RUNNING

DIRECT CURRENT RELAY MODULE

DCR100

Maretron
Vessel Monitoring & Control



The DCR100 contains six DC relays, each capable of switching up to **10 amps**. It connects directly to an NMEA 2000® network so the relays can be turned on and off from any device onboard, or remotely through N2KView®. It handles resistive DC loads like lights and inductive DC loads like pumps and motors, and can also switch AC circuits using external relays.

The DCR100 reports the current through each of the six channels, so you can determine whether loads are drawing too little current (burnt-out bulbs) or too much.

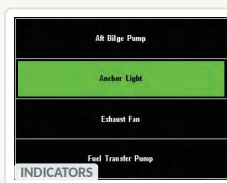
	Part number	Description	Specification
a	DCR100-01	Direct current relays	10 A max per channel · < 32 V DC · contact resistance < 10 mΩ · current sense ±100mA

Product features: six relays for On/Off control over the NMEA 2000® network · each relay capable of carrying up to 10 amps · individual relay electrical current monitoring · automatic relay over current shutdown (shuts down at approximately 12 amps) · automatic relay thermal shutdown · relays switchable using DSM Series, N2KView® or N2KView® Mobile · can be configured as an annunciator to activate a buzzer, horn or strobe light as a result of an alert · individual channels can be locked into On/Off state · individual channels can be configured with a default power-up state (On/Off/Previous). PGN 127501 binary status report; 9 to 32 V, 150 mA, LEN 3; IP64; 88.9 × 106.7 × 51.6 mm; 368.5 g.

RUN INDICATOR MODULE

RIM100 & water-in-fuel detector

Maretron
Vessel Monitoring & Control



The Run Indicator Module monitors both AC and DC electrical circuits and reports over the NMEA 2000® network whether or not the circuit is energised and running. It works equally well for manually switched loads (running lights, anchor lights, deck lights) and automatically switched loads (bilge pumps, engine exhaust and intake fans, transfer pumps) — so you know exactly when equipment is, or is not, running.

Built-in **timers** and **counters** record how long and how many times a load is energised.

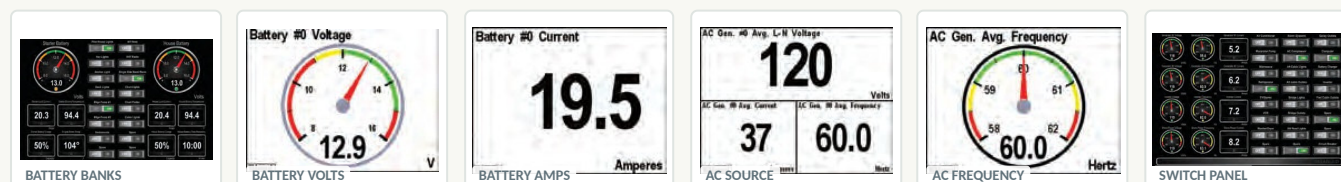
	Part number	Description	Specification
a	RIM100-01	Run indicator module	9–32 V · 50mA · LEN 1 · IP64
b	WIF-RK30880-E	Water in fuel detector	Mounts on a fuel filter bowl

Six channels — “OFF” voltage range 0VDC-1VDC and 0VAC-1VAC RMS, “ON” voltage range 9VDC to 240VDC and 9VAC to 240VAC RMS. A WIF-RK30880-E fuel detector mounted on the bottom of a fuel filter provides a voltage when water is detected in the fuel. This voltage is detected by the RIM100 and used to trigger an alert or display an indicator. Monitors and reports the running statuses of six independently connected devices — bilge pumps, winches, running lights, transfer pumps, exhaust/intake fans and water-in-fuel notification. Size 88.9 × 106.7 × 51.6 mm, 368.5 g. PGN 127501 binary status report; Maretron proprietary 130836 switch status counter and 130837 switch status timer.

ON THE DISPLAY

DC, relay and run indication screens

Maretron
Vessel Monitoring & Control



PGN	PGN name	Used by
127501	Binary status report / binary switch bank status	DCR100 · RIM100 · SIM100
127506 · 127508 · 127513	DC detailed status · battery status · battery configuration status	DCM100
127751 · 65284	DC voltage / current · DC breaker current (Maretron proprietary)	DCM100 · DCR100
130836 · 130837	Switch status counter · switch status timer (Maretron proprietary)	RIM100 · SIM100
130824 · 130825	Annunciator · Maretron proprietary	DCR100 annunciator mode

Environmental qualification for the DCR100 and RIM100: IEC 60945 exposed class, IP64, -25°C to 55°C operating and -40°C to 70°C storage, 93% RH @ 40°C, vibration 2–13.2 Hz @ ±1 mm and 13.2–100 Hz @ 7 m/s² per IEC 60945-8.7, salt mist 4 × 7 days @ 40°C per IEC 60945-8.12.

SIM100 switch indicator module

SMOKE, CARBON MONOXIDE, GAS, HIGH BILGE WATER, DOORS AND HATCHES — ALL UNDER CONSTANT SUPERVISION

GENERAL SYSTEMS MONITORING AND RECORDING

The family

Maretron
Vessel Monitoring & Control

	Model	What it does	Electrical
a	SIM100-01	Switch indicator module — six switch-closure devices, with open and short detection	9–32 V · 100mA · LEN 2
b	FPM100-01	Fluid pressure monitor — six pressure transducers, pressure/vacuum or tank level	9–32 V · 400mA · LEN 8
c	CLM100-01	Current loop monitor — six 4-20mA transducer channels	9–32 V · 400mA · LEN 8
d f	RAA100-01 · TMP100-01	Rudder angle adapter — resistive rudder senders · temperature module — four thermistor and two thermocouple channels	9–16 V, LEN 1 · 9–32 V, LEN 1
e	VDR100-01	Vessel data recorder — records every message on the network to USB	9–32 V · < 200mA · LEN 4

SWITCH INDICATOR MODULE

SIM100 & safety sensors

Maretron
Vessel Monitoring & Control

a	SIM100
b	SH KITS
c	BHW100
d	MS-1035

The SIM100 monitors switch closure devices — safety equipment (heat, smoke, carbon monoxide and explosive vapour detectors), security systems (motion, vibration, glass break, door and porthole magnetic switches) and vessel monitoring equipment (valve closed/open, high water bilge) — and broadcasts the switch state over the network.

	Part number	Description
a	SIM100-01	Switch indicator module
b	SH-003	High temp smoke/heat detector kit
—	SH-004	Photoelectric smoke/heat detector kit
—	SH-005	Ionization smoke detector & sounder kit
c	BHW100	Bilge high water detector
—	CO-CO1224T	Carbon monoxide (CO) detector (surface mount white)
—	IS216	Motion detector
—	VS-07.OHG	Vacuum switch (7" Hg or 24kPa)
d	MS-1035	Magnetic switch rectangular (indoor)
—	MS-1085-N	Magnetic switch rectangular (outdoor)
—	MS-1055-N	Magnetic switch cylinder (indoor/outdoor)
—	MS-1075	Magnetic switch recessed (indoor/outdoor)

The SIM100 also detects whether power has been disconnected from the monitored device, or the signal wires disconnected through corrosion or tampering. End of line resistor 8 kΩ ±5%, included with Maretron-supplied sensors.

ON THE DISPLAY

Safety and security indicators

Maretron
Vessel Monitoring & Control

CO ALARM	PORT HOLE	MS-1075	MS-1055-N	RUN STATUS	FIRE / CO MAP
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SIM100: 88.9 × 106.7 × 51.6 mm, 368.5 g, IP64, -25°C to 55°C. PGN 127501; proprietary 130836, 130837.

TMP100 temperature & VDR100 data recorder

SIX TEMPERATURE CHANNELS INCLUDING EXHAUST GAS · A YEAR OF VESSEL DATA ON A USB DRIVE

TEMPERATURE MODULE

TMP100 & probes

Maretron
Vessel Monitoring & Control



The TMP100 measures temperature for up to six probes and reports the information over the NMEA 2000® network — four thermistor channels and two high temperature thermocouple channels. Thermistor probes (-20°C to 80°C) cover cabin air, engine room air, refrigerator/freezer, under-bolt (inverters, chargers, pumps, motors), tank (live bait well, hot water) and air duct temperatures. The thermocouple probes (0°C to 900°C) measure **Exhaust Gas Temperature** as part of a comprehensive fuel management system.

	Part number	Description	Range
a	TMP100-01	Temperature module	4 thermistor + 2 thermocouple
b	TR3K	TMP100 ring / under bolt temperature probe	-20°C to 80°C (-4°F to 176°F)
c	TP-AAP-1	TMP100 ambient air temperature probe	-20°C to 80°C (-4°F to 176°F)
—	TP-IP-1	TMP100 immersion (tanks, plenums, etc.) temperature probe	-20°C to 80°C (-4°F to 176°F)
—	TP-EGT-1	TMP100 exhaust gas temperature (EGT) probe	0°C to 900°C (32°F to 1652°F)

Accuracy ±2°C (±3.6°F) with supplied probes. 9–32 V, < 50mA, LEN 1; 88.9 × 106.7 × 51.6 mm, 368.5 g; IP64; -25°C to 55°C. PGNs 130310, 130311, 130312, 130316, 130823.

VESSEL DATA RECORDER

VDR100 & accessories

Maretron
Vessel Monitoring & Control



The VDR100 records messages transmitted from every product on the vessel network. Recorded data is used for performance analysis, vessel tracking, preventative maintenance, network diagnostics, warranty incidents and accident investigation. Each message is stored in solid-state memory with retrieval via a removable USB flash drive; the supplied 16 GB drive holds weeks or more of data, and a larger drive stores a year or more.

A **circular buffer** means the oldest data is overwritten only after the entire memory is filled. Free N2KExtractor® software creates comma-delimited (.csv) files that can be read into a spreadsheet for graphing or analysis.

	Part number	Description
a	VDR100-01	Vessel data recorder
—	PX0852	USB waterproof cover
b	PX0837/5M00	Waterproof Ethernet cable 16.4'
	M003029	16 GB USB flash drive

Compact waterproof IEC 60945 housing · solid state memory via removable USB flash drive (included) · circular buffer · waterproof USB cover included · free N2KExtractor™. 9–32 V, < 200mA, LEN 4; 127 × 114 × 60 mm, 340 g, IP67.

ON THE DISPLAY

Temperature, probes & recorded data

Maretron
Vessel Monitoring & Control



N2KExtractor® connects directly to the VDR100 over Ethernet or reads the removable USB drive, and downloads data stored in the Maretron Telemetric Cloud.

Navigation instruments & the WSO200

AWARD-WINNING ULTRASONIC WIND AND WEATHER, GPS, SOLID STATE COMPASS AND TRIDUCER — ALL TO IEC 60945

THE NAVIGATION INSTRUMENT FAMILY

Wind · GPS · heading · depth

Maretron
Vessel Monitoring & Control



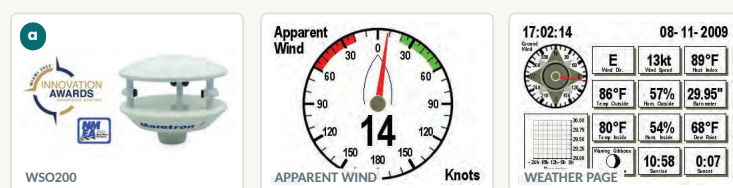
State-of-the-art navigation begins with Maretron award-winning instruments. Maretron were the first to bring solid state compass technology to the marine industry, resulting in superior accuracy and incredible response time — rock-solid radar overlay on charting software and unprecedented autopilot performance. All navigation instruments are engineered to IEC 60945.

	Model	Description	Electrical
a	WSO200	Ultrasonic wind and weather station — wind speed and direction, air temperature, barometric pressure, relative humidity	9–32 V · < 50mA · LEN 1
b	GPS200-01	GPS/GLONASS antenna and receiver — ten position fixes per second	9–32 V · < 150mA · LEN 3
c	SSC300-01	Solid state rate/gyro compass — heading, rate of turn, pitch and roll	9–16 V · < 50mA · LEN 1
d	DST110-01	Depth / speed / temperature triducer, 100 metre depth	9–32 V · < 200mA · LEN 4

ULTRASONIC WIND AND WEATHER STATION

WSO200

Maretron
Vessel Monitoring & Control



The second generation WSO200 is a marine grade ultrasonic weather station that accurately measures wind speed and direction, air temperature, barometric pressure, relative humidity, wind chill factor, heat index and dew point. Wind is calculated from **six ultrasonic sensors in delta configuration** — no moving parts to wear out or get caught in the rigging, and no bearing wear, salt and dirt build-up or bird perching to cause failure or inaccuracy.

Precise wind speed and direction is achieved under tilt of up to **30°**, as with heeled sailboats or powerboats in pitching and rolling seas. Second generation enhancements: user-replaceable humidity sensor, higher signal-to-noise ratio, lower power consumption. Mounts on a 1"-14 standard marine mount, waterproof to IP67.

Part number	Description
a WSO200	Ultrasonic wind/weather station

Parameter	Range	Resolution & accuracy
Wind speed	0 to 99 knots (1 to 185 kph)	0.1 knot (0.19 kph) · ±10% or 1 knot (1.9 kph) at 0° tilt
Wind direction	360°	±5° at 0° tilt (operates to 30° tilt)
Temperature	-25°C to 55°C	0.18°F (0.1°C) · ±1.8°F (1°C)
Relative humidity	0–99% RH	1% RH · ±4% RH
Barometric pressure	26 to 32" HG (880 to 1080 mb)	0.03" HG (1 mb) · ±0.09" HG (±3 mb)
Size · weight · mounting	5.91" dia x 4.85" tall (150mm dia x 123.2mm tall) · 10 oz (283g)	1"-14 TPI standard marine mount · IP67
PGNs transmitted	130306 · 130310 · 130311 · 130313 · 130314	Wind data · environmental parameters · humidity · actual pressure



Combine the WSO200 with a DST110 triducer, a GPS200 receiver and an SSC300 compass to view true vessel-referenced wind speed and direction as well as ground-referenced speed and direction on a DSM Series or TSM Series display, or on any device running N2KView® V3.

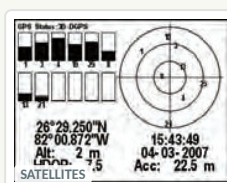
GPS200 receiver & SSC300 solid state compass

TEN POSITION FIXES PER SECOND · BETTER THAN 0.7° HEADING ACCURACY THROUGH ±45° OF ROLL AND PITCH

GPS ANTENNA / RECEIVER

GPS200

Maretron
Vessel Monitoring & Control



The second generation GPS200 is a GPS/GLONASS antenna and receiver capable of producing **ten position fixes per second**. It has unprecedented sensitivity and can even be mounted underneath a fibreglass deck, and it broadcasts precision magnetic variation information using the current position and world magnetic model (WMM2020).

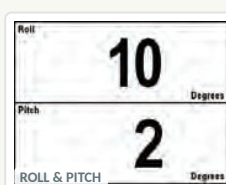
The GPS200 automatically decodes correction signals from Satellite Based Augmentation Systems — WAAS (North America), EGNOS (Europe), MSAS (Asia) and GAGAN (India) — to provide better than 2.5 m accuracy. It mounts to a standard marine mount with a 1"-14 TPI male pipe end, or directly to a deck.

	Parameter	Value	Comment
a	Part number	GPS200-01	GPS antenna/receiver
—	Supported positioning systems	GPS, GLONASS	Simultaneously
—	Position accuracy	< 3 m autonomous · < 2.5 m WAAS	2D RMS; WAAS depends on accuracy of correction data
—	Channels · tracking sensitivity	99 · -161dBm	33 tracking, 99 acquisition
—	Position · speed · time update rate	10/s · 10/s · 1/s	10 Hz position fix calculation rate
—	Hot start · cold start	1 second · 33 seconds	Start within hours of last power down · start from unknown position
—	Altitude · velocity limit	18000 m · 515 m/sec	—
—	Battery backup	Lithium (4-5 days)	Holds position for hot starts
—	Size · weight · mounting	4" diameter (102mm) x 1.65" tall (42mm) · 6 oz	Deck or pole; fits 1" - 14 - UNS-2B thread, 1"-14 TPI standard marine mount
—	Electrical · protection	9 to 32 V · < 150mA · LEN 3 · IP67	IEC 60945 exposed, -25°C to 55°C
—	PGNs transmitted	126992 · 127258 · 129025 · 129026 · 129029 · 129538 · 129539 · 129540 · 129541	System time · magnetic variation · position rapid update · COG and SOG rapid update · GNSS position data, control status, DOPs, satellites in view, GPS almanac data

SOLID STATE COMPASS

SSC300

Maretron
Vessel Monitoring & Control



The SSC300 is a solid state rate/gyro electronic compass providing better than **0.7° heading accuracy** through ±45° of roll and pitch, and better than 1° roll and pitch accuracy in static conditions. Each unit is factory calibrated. It delivers heading and rate of turn twenty times per second and vessel attitude ten times per second. A micro-machined 3-axis rate gyro works with the 3-axis accelerometer through advanced stabilisation algorithms for accurate, stable readings during hard turns or rough seas — an ideal heading sensor for autopilot or radar overlay.

	Part number	Description	Specification
a	SSC300-01	Solid-state rate/gyro compass	9-16 V · < 50mA · LEN 1 · IP67
b	MARE-004	SSC300 compass NMEA 0183 10 metre connection cable	Optional NMEA 0183 output

Static heading accuracy < 0.7° RMS at ±45° pitch and roll, 15°C to 35°C · heading resolution 0.1° · settling time 1 second to static accuracy after a 35°/second turn · heading update 20/s · automatic deviation · in-boat alignment calibration · pitch and roll range ±80°, accuracy < 1°, resolution 0.1°, update 10/s · rate of turn range 0-90°/second, accuracy ±1°/second, update 10/s · NMEA 0183 compatible up to 38 400 baud (40 Hz update rate). Size 4.46" x 3.23" x 2.14" (113mm x 82mm x 54mm) including mounting flanges, 7 oz (198 g). PGNs 127250 vessel heading, 127251 rate of turn, 127257 attitude.

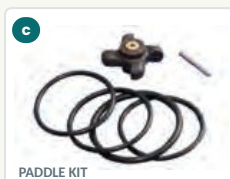
DST110 depth / speed / temperature triducer

SMART™ RETRACTABLE TRANSDUCER — PRECISE DIGITAL DEPTH, ACCURATE SPEED AND EXACT WATER TEMPERATURE ABOVE 40 KNOTS

DEPTH / SPEED / TEMPERATURE TRIDUCER

DST110

Maretron
Vessel Monitoring & Control



The DST110 Smart™ Retractable Depth/Speed/Temperature Transducer delivers precise digital depth, accurate speed and exact water temperature even at speeds above 40 knots. Its patented Smart™ sensor technology, retractable and removable sensor and NMEA 2000® connectivity make it easy to interpret, install and maintain.

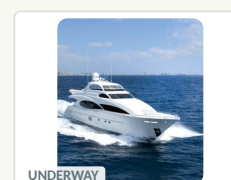
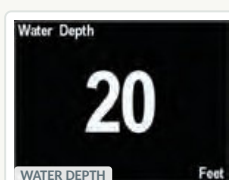
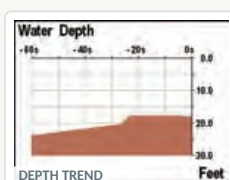
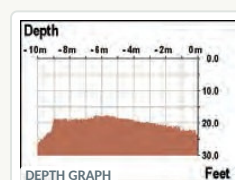
Plastic or bronze housings suit any hull material. A blank plug replaces the sensor unit when the vessel is docked for extended periods or trailered, preventing damage and reducing fouling growth. The DST110 is CE compliant (IEC 60945) and manufactured under ISO 9001 procedures.

	Part number	Description
a	DST110-01	Depth/Speed/Temperature Triducer® (100 metre depth)
—	M33-100	Bronze housing kit for DST100/DST110
c	33-398-04PW	Spare paddle wheel kit

SPECIFICATIONS

DST110 — depth, speed & temperature

Maretron
Vessel Monitoring & Control



Parameter	Value	Comment
Depth operating frequency	235 kHz	Wide beam angle
Beam width	10° × 44°	—
Minimum · maximum depth	0.4 metres · 100 metres	Deadrise angle tolerant · no calibration required
Depth accuracy	±20 cm · ±3%	0.6–7 metres · 7–100 metres
Depth tracking speed · update	Up to 50 knots · 1 second	High speed bottom tracking capability
Transmission power	100 Watts	2% duty cycle
Speed sensor · range · update	Paddlewheel · 1–50 knots · 1 second	Microprocessor signal processing accuracy
Water temperature range	-10°C to 40°C	Fast response time
Water temperature accuracy	±1.0°C · resolution 0.01°C	No calibration required
Deadrise angle	≤ 22°	—
Size · weight	2.94" dia × 4.87" tall (74.7 mm dia × 123.7 mm) · 12 oz (340 g)	Including flanges for mounting; cable length 2 m; 2-12" threads
Mounting · hole diameter	Lexan / bronze / stainless steel · 2" (51 mm)	Bronze / stainless steel optional
IEC 60945 class · protection	Submerged · IP68	-10°C to 40°C operating, -30°C to 70°C storage; water immersion per IEC 60945-8.9
Electrical	9 to 32 Volts · < 200mA · LEN 4	Reverse battery and load dump protected
PGNs transmitted	128267 · 128259 · 128275 · 130310 · 130311 · 130312	Water depth (1/s) · speed water referenced (1/s) · distance log (1/s) · environmental parameters (2/s) · temperature (0.5/s)
Response to requested PGNs	126464 · 126996 · 126998	PGN list · product information · configuration information
Protocol PGNs	059392 · 059904 · 060928 · 065240 · 126208	ISO acknowledge, request, address claim, address command · NMEA request/command/acknowledge
Certifications	NMEA 2000® · IEC 61162-3 · IEC 60945 · FCC and CE mark	Manufactured under ISO 9001 procedures

NMEA 2000® cables and connectors

THE APPROVED PHYSICAL INTERFACE — MICRO, MID AND MINI TRUNK AND DROP LINE CABLING SYSTEMS

ABOUT MICRO, MID AND MINI CABLE SYSTEMS

Choosing the cable system

Maretron
Vessel Monitoring & Control



The NMEA 2000® standard goes beyond defining message content and includes requirements for the cabling used to interconnect electronic components — the physical interface. There are three types of cabling system: **Micro**, **Mid** and **Mini**. The Micro/Mid system is generally used for smaller networks requiring less power (less than 4 amps per network leg) while the Mini system is used for larger networks (more than 4 amps but less than 8 amps per leg).

	System	Typical use	Outside diameter	Current	Max distance
a	Micro	Drop line connecting devices to the trunk; trunk and drops on smaller networks	0.24 to 0.28 inches	4 amps	100 metres (328 feet)
b	Mid	Trunk or drop on smaller networks; larger power conductors give less voltage drop over long runs	0.33 inches	4 amps	250 metres (820 feet)
c	Mini	Trunk line, because of its greater current carrying capacity; also usable for drop lines	0.41 to 0.49 inches	8 amps	250 metres (820 feet)

Maximum installed bend radius is 7x the cable diameter for both Micro and Mini cable. Maximum drop line length is 6 metres (20 feet) from the trunk; cumulative drop line length must not exceed 78 metres (256 feet); a maximum of 50 physical devices may be connected to one network.

NMEA 2000® CABLE FEATURES

Why the approved system matters

Maretron
Vessel Monitoring & Control



Feature	Why it matters
Simple trunk and drop line topology	Interconnects all NMEA 2000® equipment
Drop line topology	Allows powered component removal or re-connection while the rest of the network remains operational
Power and ground in the cable	Powers equipment drawing less than 1 amp per device
Keys and keyways in the connectors	Simple, error-free connections
Screw thread connectors	Reduce chances of accidental disconnects of essential equipment
Waterproof connection system	Prevents corroded intermittent connections and continues to operate even while submerged in the bilge
Three independent cable shields	Power pair, signal pair and overall cable — protects the system from external noise sources such as high-power radio transmitters and radar units
Nickel plated brass connector ends	Ideally suited to the harsh marine environment
Phosphor bronze contact base	Gold over nickel plate for reliable connections
Overmoulded cable connector ends	Provide strain relief
Simple diagnostic components	Enable trained and untrained personnel to diagnose and troubleshoot network installations

NETWORK BUILDING BLOCKS

What a Micro/Mid or Mini network is made of

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Component	Micro / Mid network (up to 4 amps per leg)	Mini network (up to 8 amps per leg)
Trunk cable	Micro or Mid bulk cable, or double-ended cordsets	Mini bulk cable, or double-ended cordsets
Tee	Micro/Mid tee	Mini tee · Mini/Micro tee
Power insertion	Micro/Mid powertap tee	Mini powertap with fuses
Termination	Micro termination resistor (male or female), inline terminator	Mini termination resistor, with or without LED
Bulkhead penetration	Micro bulkhead feed-thru	Mini bulkhead feed-thru
Clustered drops	Multiport box, homerun back to the trunk through a cordset and tee	Multiport box on a Micro drop from a Mini/Micro tee
Field-made cable · diagnostics	Field-attachable connectors, straight or 90° · N2KMeter®	Mini field-attachable connectors · N2KMeter®

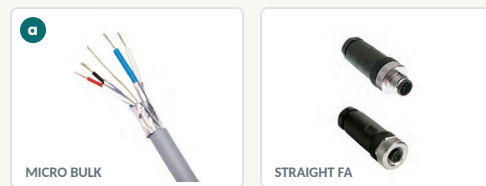
Micro bulk cable & field-attachable connectors

BUILD EXACT-LENGTH CABLES AT THE JOB SITE — COLOUR-CODED SCREW TERMINALS, STRAIGHT AND 90°

MICRO BULK CABLE

CG1 series — gray

Maretron
Vessel Monitoring & Control



Micro bulk cable is primarily used as drop cable, but it can also be used at the trunk line depending on network power requirements. Bulk cable with field-attachable connectors allows for maximum flexibility as cables can be made on the job to exact lengths.

Meets and exceeds NMEA 2000® specifications for the highest reliability · trunk or drop cable for use with Micro connectors.

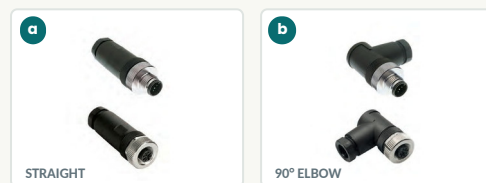
	Part number	Reel length		Part number	Reel length
a	CG1-10	10 M (gray)	—	CG1-50	50 M (gray)
—	CG1-20	20 M (gray)	—	CG1-100C	100 M w/spool (gray)
—	CG1-30	30 M (gray)	—	CG1-750C	750 M w/spool (gray)
—	CG1-40	40 M (gray)	—	—	—

Conductor identification: 1 bare (shield) · 2 red (NET-S) · 3 black (NET-C) · 4 white (NET-H) · 5 blue (NET-L). Cable dimensions .285 ±.010" × .190 ±.015".

MICRO / MID FIELD-ATTACHABLE CONNECTORS

Straight and 90°, male and female

Maretron
Vessel Monitoring & Control



Field-attachable connectors allow you to make field connections to bulk cable. The colour-coded screw terminals match the individual wire colours found within the bulk cable for error-free field installation, and the rugged housing material is designed to withstand harsh marine environments.

The 90° connectors are particularly well suited to tight spaces such as the back of displays where there is limited room for a straight connector. Waterproof rated to IP67.

	Part number	Description		Part number	Description
a	FA-CF-ST	Micro/Mid field attachable connector (straight female)	b	FA-CF-90	Micro/Mid field attachable connector (90° female)
—	FA-CM-ST	Micro/Mid field attachable connector (straight male)	—	FA-CM-90	Micro/Mid field attachable connector (90° male)

SPECIFICATIONS

Micro bulk cable & field-attachable connectors

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Parameter	Micro bulk cable (CG1)	Field-attachable connectors
Housing / plating	Outer jacket PVC / gray	Nylon / black; coupling nut brass / nickel
Contact material / plating	—	Brass / gold (straight) · brass / Optaloy (90°)
Insulation material	PE (data wires), SRPVC (power wires)	—
Construction	4 × 22 AWG	Maximum wire size 16 (1.29 mm) AWG
Cable grip range	—	6-8mm (.27" cable diameter)
Power pair	2 × 22 (0.65 mm) AWG · 18.1 Ohms/1000ft · 6 amps max · red/black	Rated current 4.0 amps
Data pair	2 × 22 (0.65 mm) AWG · 120 ohms ±10% · 11.33 pF/ft ±10% · white/blue	Rated voltage 30 V AC / 36 V DC
Protection class	IEC IP67	IEC IP67
Temperature range	-40°C to 85°C (-40°F to 185°F)	-40°C to 85°C (-40°F to 185°F)
Approvals	UL PLTC 75°C sunlight resistant E90625, AWM 80°C 300 V · CSA CMX-OUTDOOR-CMG LL54185 75°C, AWM I/II A/B 80C 300V FT4	NMEA 2000® approved · IEC-61162-3
Connector dimensions	—	Straight 60 mm (2.36") male / 55 mm (2.17") female · 90° 39.4 mm (1.55") × 40 mm (1.57") · M12x1 thread, Ø20.0

Micro cordsets, tees & powertap

NINE CORDSET LENGTHS · THE STANDARD TEE · THE TWO-INPUT POWERTAP TEE

MICRO DOUBLE-ENDED CORDSETS

Male to female, 0.5 to 10 metres

Maretron
Vessel Monitoring & Control



Double-ended cordsets are used for trunk or drop lines and make for a secure connection and simple timesaving installation. The connectors are keyed for error-free connection and are waterproof for continued operation while submerged in the bilge. Rugged, **IP68 rated** connectors give continued connection integrity in marine environments, with various cable lengths to match installation requirements.

	Part number	Length		Part number	Length
a	CM-CG1-CF-00.5	M to F — 0.5 M (gray)	—	CM-CG1-CF-05.0	M to F — 5 M (gray)
—	CM-CG1-CF-01.0	M to F — 1 M (gray)	—	CM-CG1-CF-06.0	M to F — 6 M (gray)
—	CM-CG1-CF-02.0	M to F — 2 M (gray)	—	CM-CG1-CF-08.0	M to F — 8 M (gray)
—	CM-CG1-CF-03.0	M to F — 3 M (gray)	—	CM-CG1-CF-10.0	M to F — 10 M (gray)
—	CM-CG1-CF-04.0	M to F — 4 M (gray)	—	—	—

Cordset specification: contact carrier and moulded body thermoplastic PUR / blue-gray · contacts brass/gold · coupling nut brass/nickel · cable grip range 0.59" · 4.0 amps, 250 V · IEC IP68, NEMA 1, 3, 4, 6P · -40°C to 85°C (-40°F to 185°F) · cable 4 × 22 AWG with 22 AWG drain wire, shielding (3-Levels): foil overall, foil power pair, foil data pair · UL PLTC 75°C sunlight resistant E90625 · CSA CMX-OUTDOOR-CMG LL54185 · NMEA 2000® approved · IEC-61162-3. Connector 48.5 mm (1.91") male, 55.2 mm (2.17") female, Ø15.0 mm (0.59"), M12x1, anti-vibration detent.

MICRO TEE

Tapping into the trunk line

Maretron
Vessel Monitoring & Control



A tee is used to tap into the trunk line for adding a drop connection. The standard tee is also available with a cap for a protected diagnostic connection. Tees can be mated with all other devices on the network of the same connector style. Gold contacts for greatest reliability; keyed connectors for error-free connections.

	Part number	Description	Dimensions
a	CM-CF-CF	Micro tee	55.0 mm (2.17") · M12x1

Micro tee specification: moulded body thermoplastic PUR / blue · contact carrier PA 6 (nylon) / black · contacts brass / gold · coupling nut brass / nickel · rated current 4.0 amps, rated voltage 60 V · IEC IP68, NEMA 1, 3, 4, 6P · -40°C to 85°C (-40°F to 185°F) · NMEA 2000® approved · IEC IP67.

MICRO / MID POWERTAP TEE

Two power inputs on one tee

Maretron
Vessel Monitoring & Control



A powertap tee is connected to a network backbone just like any tee, but rather than connecting a device its purpose is to provide "bus" power. The Maretron powertap tee uniquely provides **two power inputs**, permitting doubled power provision for devices. The yellow cable indicates power and cannot be confused with gray network cable.

	Part number	Description
a	CF-SPWRO5-CF	Micro/Mid powertap tee — FM (left) / 5 metre 5 wire power drop (bottom) / FM (right)

Colour	Name	Usage	Connector
Blue	NET-C	Ground	J1
Brown	NET-S	Power	J1
Gray	SHIELD	Drain	J-1 & J-2
Black	NET-C	Ground	J2
White	NET-S	Power	J2

Powertap tee specification: moulded body thermoplastic PUR / yellow · contact carrier PA 6 (nylon) / black · contacts brass / gold · cable jacket PVC / yellow · 5 × 18 (1.02 mm) AWG · 250 V, 4.0 amps max · IEC IP67, NEMA 1, 3, 4, 6P · -40°C to 105°C (-40°F to 221°F) · NMEA 2000® approved · IEC-61162-3.

Micro terminators, feed-thru & multiport box

TWO TERMINATORS ON EVERY NETWORK · WATERTIGHT BULKHEAD PENETRATION · CONSOLIDATED DROPS

MICRO TERMINATION RESISTORS

TR-CM · TR-CF · IT-CM-CF



TERMINATORS



M / F PAIR

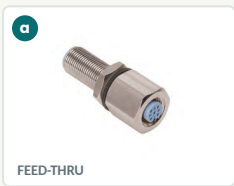
Two termination resistors are required on every NMEA 2000® network, one at each end of the trunk line. Normally a **male** termination is used, since male pins tend to point back to the power source; where the gender is reversed a female terminator may be required. The **inline terminator** is used where the network is terminated at a product — for example a GPS or weather station at the top of a mast.

	Part number	Description	Resistance
a	TR-CM	Micro termination resistor (male)	120 ohms (1/2 W)
—	TR-CF	Micro termination resistor (female)	120 ohms (1/2 W)
—	IT-CM-CF	Micro inline terminator	121 ohms (1/2 W)

Moulded body and contact carrier thermoplastic PUR / blue-gray for TR-CM and TR-CF, thermoplastic PUR / black for IT-CM-CF · contacts brass / gold · coupling nut brass / nickel · rated voltage 10-30 V DC, 250 V · IEC IP68, NEMA 1, 3, 4, 6P · NMEA 2000® approved · IEC-61162-3. Dimensions 55.2 mm (2.17") and 48.5 mm (1.91"), Ø15.0 mm (0.59"), Ø16.2 mm (0.64") inline, M12x1.

MICRO BULKHEAD FEED-THRU

BHF-CM-CF



FEED-THRU



PANEL MOUNT

The bulkhead feed-thru allows ease of installation through panels or bulkheads and establishes future connection points in a network installation. It also maintains the integrity of watertight bulkheads by providing a waterproof seal and connection, with rugged keyways for positive alignment. Waterproof rated to IP67.

	Part number	Description	Accommodates wall thickness
a	BHF-CM-CF	Micro bulkhead feed-thru	.040" (1.0 mm) to .875" (22.2 mm)

Contact carrier PA 6 (nylon) / blue-gray · contacts brass / gold · housing brass nickel · gasket nitrile (Buna N) · 250 V, 4.0 amps max · 5 × 22 (0.65 mm) AWG · IEC IP67, NEMA 1, 3, 4, 6P · -40°C to 105°C (-40°F to 221°F) · NMEA 2000® approved · IEC 61162-3. Supplied with lockwasher LW-M12 and locknut LN-M12; typical panel cutout Ø19.6 mm (0.77").

MULTIPORT BOX

CM-CF-4 — Micro/Mid male homerun, Micro/Mid female drops



MULTIPORT BOX



DROP CORDSET

Multiport boxes allow several drop cables to be consolidated and connected back to the trunk, eliminating the need for numerous tees near a single point — ideal for consolidating many connections, for example behind dashboards. Multiport boxes connect back to the trunk through a double-ended cordset and tee.

	Part number	Description	Electrical
a	CM-CF-4	Multiport box (Micro-Mid male homerun / Micro-Mid female drops)	250 V · 4.0 amps

The multiport box requires the purchase of an additional double-ended cordset for connection back to the trunk.

Housing nylon / blue-gray · receptacle brass / nickel · contact carrier nylon / black · contacts brass / gold · IEC IP67 when receptacles are covered · -30°C to 80°C (-22°F to 176°F) · NMEA 2000® approved · IEC-61162-3. Overall length 126.0 mm; four M12x1 ports (J1-J4) plus P1 homerun; Ø3.5 mm through mounting holes for M3 socket head screws, 12 mm minimum length; nine removable labels included.

THE MICRO / MID SYSTEM

Every component in one view



CG1 BULK



FA STRAIGHT



FA 90°



POWERTAP TEE



90° ELBOW

A Micro/Mid network carries up to 4 amps per leg. Build the trunk from bulk cable and field-attachable connectors, or from double-ended cordsets between tees; insert power through a powertap tee; terminate both ends; pass through watertight bulkheads with a feed-thru; and consolidate clustered drops with a multiport box.

Mid bulk cable — gray & blue

OPTIMISED FOR VOLTAGE-DROP-SENSITIVE NETWORKS — POWER PAIR WIRES WITH HALF THE RESISTANCE OF MICRO CABLE

MID BULK CABLE

DG1 gray & DB1 blue

Maretron
Vessel Monitoring & Control



Mid bulk cable is primarily used as drop cable, but it can also be used at the trunk line depending on network power requirements. Bulk cable with field-attachable connectors allows cables to be made on the job to exact lengths. Mid cable and connectors are rated to 4 amps just like Micro cable, but the **larger diameter power conductors** provide less voltage drop, especially for long runs.

	Part number	Reel length — gray		Part number	Reel length — blue
a	DG1-10	10 M (gray)	—	DB1-10	10 M (blue)
—	DG1-20	20 M (gray)	—	DB1-20	20 M (blue)
—	DG1-30	30 M (gray)	—	DB1-30	30 M (blue)
—	DG1-40	40 M (gray)	—	DB1-40	40 M (blue)
—	DG1-50	50 M (gray)	—	DB1-50	50 M (blue)
—	DG1-100C	100 M w/spool (gray)	—	DB1-100C	100 M w/spool (blue)
—	DG1-600C	600 M w/spool (gray)	—	DB1-600C	600 M w/spool (blue)

MID DOUBLE-ENDED CORDSETS — GRAY

DM-DG1-DF series

Maretron
Vessel Monitoring & Control



Double-ended cordsets are used for trunk or drop lines and make for a secure, time-saving installation. Rugged, **IP68 rated** connectors, keyed for error-free connection and waterproof even while submerged in the bilge.

	Part number	Length		Part number	Length
a	DM-DG1-DF-00.5	M to F — 0.5 M (gray)	—	DM-DG1-DF-05.0	M to F — 5 M (gray)
—	DM-DG1-DF-01.0	M to F — 1 M (gray)	—	DM-DG1-DF-06.0	M to F — 6 M (gray)
—	DM-DG1-DF-02.0	M to F — 2 M (gray)	—	DM-DG1-DF-08.0	M to F — 8 M (gray)
—	DM-DG1-DF-03.0	M to F — 3 M (gray)	—	DM-DG1-DF-10.0	M to F — 10 M (gray)
—	DM-DG1-DF-04.0	M to F — 4 M (gray)	—	—	—

MID DOUBLE-ENDED CORDSETS — BLUE

DM-DB1-DF series

Maretron
Vessel Monitoring & Control



The blue Mid cordsets are electrically identical to the gray version, with a PVC / blue outer jacket. Full cable and connector specifications are tabulated overleaf.

	Part number	Length		Part number	Length
a	DM-DB1-DF-00.5	M to F — 0.5 M (blue)	—	DM-DB1-DF-05.0	M to F — 5 M (blue)
—	DM-DB1-DF-01.0	M to F — 1 M (blue)	—	DM-DB1-DF-06.0	M to F — 6 M (blue)
—	DM-DB1-DF-02.0	M to F — 2 M (blue)	—	DM-DB1-DF-08.0	M to F — 8 M (blue)
—	DM-DB1-DF-03.0	M to F — 3 M (blue)	—	DM-DB1-DF-10.0	M to F — 10 M (blue)
—	DM-DB1-DF-04.0	M to F — 4 M (blue)	—	—	—

Elbows, adapters & special cordsets

TURNING TIGHT RADIUSES · NYLON-TO-METAL CONNECTIONS · THE 25 METRE MAST CORDSET

SPECIFICATIONS

Mid cable & cordsets – DG1 / DB1



Parameter	Value
Outer jacket · insulation	PVC / gray (DG1), PVC / blue (DB1) · PE (data wires), PVC (power wires)
Construction	2 × 16 (1.29 mm) AWG, 2 × 20 (0.81 mm) AWG, 20 (0.81 mm) AWG drain wire
Shielding (3 levels)	Foil (overall), foil (power pair), foil (data pair)
Power pair	2 × 16 (1.29 mm) AWG · 4.1 ohms/1000 ft max · 14 amps max · red / black
Data pair	2 × 20 (0.81 mm) AWG · 120 ohms ±10% · 10.75 pF/ft · white / blue
Connector materials	Contact carrier and moulded body thermoplastic PUR / blue-gray · contacts brass / gold · coupling nut brass / nickel · outside diameter 0.59"
Ratings · protection · temperature	4.0 amps, 250 V · IEC IP68, NEMA 1, 3, 4, 6P · -40°C to 80°C (-40°F to 176°F)
Approvals	UL PLTC 75°C sunlight resistant E90625, AWM 80°C 300 V · CSA CMX-OUTDOOR-CMG LL54185 75°C, AWM I/II A/B 80C 300V FT4 · NMEA 2000® approved · IEC-61162-3

MICRO 90° MALE TO FEMALE CONNECTOR

ELB-CM-CF



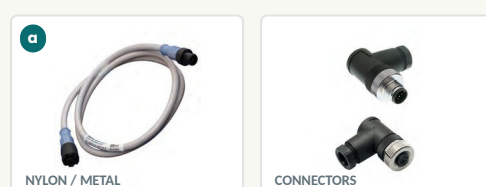
A 90 degree male to female connector for Micro or Mid size cable runs or connections, intended to aid turning tight radiuses without unduly straining the wires within a cable. Ideal when mounting a device in a location with shallow depth possibilities. NMEA 2000® approved and waterproof rated to IP67.

	Part number	Description	Specification
a	ELB-CM-CF	Micro 90° male to female connector	4.0 amps · 50 V · IEC IP67

Moulded body thermoplastic PUR / gray · contact carrier nylon PUR · contacts brass / gold · coupling nut brass / nickel · -40°C to 80°C · NMEA 2000® approved, IEC 61162-3.

NYLON TO METAL CONNECTOR CABLE

QCM-CG1-QCF-01



Some products use inexpensive nylon connectors, and when connected with metal connectors the nylon threads can be damaged. This cable eliminates the problem by allowing nylon-to-nylon connections and metal-to-metal connections. NMEA 2000® approved and waterproof rated to IP67, with quick-connect couplings at both ends.

	Part number	Description	Specification
a	QCM-CG1-QCF-01	Nylon to metal connector cable	4.0 amps · 250 V · IEC IP67

Moulded head thermoplastic PUR / blue-gray · contact carrier PUR / black · contacts brass / gold · snap-lock POM / black · IEC IP67, NEMA 1, 3, 4, 6P · -40°C to 105°C · cable 4 × 32 (0.65 mm) AWG with 22 AWG drain, three foil shields · M12x1 quick-connect coupling.

MID SINGLE-ENDED CORDSET

DF-DB1-25.0 – female to open pigtail, 25 metre blue



This 25 metre length Mid size cable with a Micro female connector on one end is intended for installation of devices such as a weather station. The female connector should point towards the device, and a field-attachable male connector should be made onto the end connecting to the rest of the backbone.

NMEA 2000® approved · meets ABYC power pair size requirements · waterproof rated to IP67.

	Part number	Description	Specification
a	DF-DB1-25.0	Mid single-ended cordset — female to open pigtail — 25 metre (blue)	4.0 amps · 250 V · IEC IP68

Moulded head thermoplastic PUR / blue-gray · contacts brass / gold · connector OD 0.59" · IEC IP68, NEMA 1, 3, 4, 6P · -40°C to 80°C · cable PVC / blue, 2 × 16 AWG power, 2 × 20 AWG data, 20 AWG drain, three foil shields.

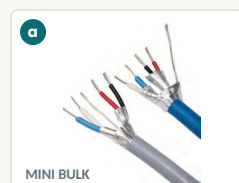
Mini bulk cable & field-attachable connectors

THE 8 AMP TRUNK SYSTEM — GRAY AND BLUE REELS FROM 10 TO 750 METRES

MINI BULK CABLE

NG1 gray & NB1 blue

Maretron
Vessel Monitoring & Control



Mini bulk cable is primarily used as trunk cable, but it can also be used as drop lines. Bulk cable with field-attachable connectors allows for maximum flexibility as cables can be made on the job to exact lengths. Meets and exceeds NMEA 2000® specifications for the highest reliability.

	Part number	Reel length — gray		Part number	Reel length — blue
a	NG1-10	10 M (gray)	—	NB1-10	10 M (blue)
—	NG1-20	20 M (gray)	—	NB1-20	20 M (blue)
—	NG1-30	30 M (gray)	—	NB1-30	30 M (blue)
—	NG1-40	40 M (gray)	—	NB1-40	40 M (blue)
—	NG1-50	50 M (gray)	—	NG1-50	50 M (blue) — part number as listed by Maretron
—	NG1-100C	100 M w/spool (gray)	—	NB1-100C	100 M w/spool (blue)
—	NG1-750	Mini bulk cable (non-continuous) — 750 M w/spool (gray)	—	NB1-750	Mini bulk cable (non-continuous) — 750 M w/spool (blue)

Confirm the 50 metre blue reel part number with Custom Marine at time of order.

MINI FIELD-ATTACHABLE CONNECTORS

FA-NM-ST & FA-NF-ST

Maretron
Vessel Monitoring & Control



Field-attachable connectors allow you to make field connections to bulk cable. The colour-coded screw terminals match the individual wire colours found within the bulk cables for error-free field installation, and the rugged housing material is designed to withstand harsh marine environments.

	Part number	Description	Thread
a	FA-NF-ST	Mini field attachable connector (female)	7/8-16UN
—	FA-NM-ST	Mini field attachable connector (male)	7/8-16UN

MINI DOUBLE-ENDED CORDSET — GRAY

NM-NG1-NF series

Maretron
Vessel Monitoring & Control



Double-ended cordsets are used for trunk or drop lines and make for a secure connection and simple time-saving installation. Rugged, **IP68 rated** connectors for continued connection integrity in the marine environment, with various cable lengths to match installation requirements.

	Part number	Length		Part number	Length
a	NM-NG1-NF-00.5	M to F — 0.5 M (gray)	—	NM-NG1-NF-05.0	M to F — 5 M (gray)
—	NM-NG1-NF-01.0	M to F — 1 M (gray)	—	NM-NG1-NF-06.0	M to F — 6 M (gray)
—	NM-NG1-NF-02.0	M to F — 2 M (gray)	—	NM-NG1-NF-08.0	M to F — 8 M (gray)
—	NM-NG1-NF-03.0	M to F — 3 M (gray)	—	NM-NG1-NF-10.0	M to F — 10 M (gray)
—	NM-NG1-NF-04.0	M to F — 4 M (gray)	—	—	—

Mini cordsets, tees & elbow

BLUE CORDSETS IN NINE LENGTHS · MINI AND MINI/MICRO TEES · THE 90° ELBOW

MINI DOUBLE-ENDED CORDSET — BLUE

NM-NB1-NF series

Maretron
Vessel Monitoring & Control

Double-ended cordsets are used for trunk or drop lines and make for a secure connection and simple time-saving installation. The connectors are keyed for error-free connection and are waterproof for continued operation even while submerged in the bilge. Rugged, **IP67 rated** connectors, with various cable lengths to match installation requirements.

	Part number	Length		Part number	Length
a	NM-NB1-NF-00.5	M to F — 0.5 M (blue)	—	NM-NB1-NF-05.0	M to F — 5 M (blue)
—	NM-NB1-NF-01.0	M to F — 1 M (blue)	—	NM-NB1-NF-06.0	M to F — 6 M (blue)
—	NM-NB1-NF-02.0	M to F — 2 M (blue)	—	NM-NB1-NF-08.0	M to F — 8 M (blue)
—	NM-NB1-NF-03.0	M to F — 3 M (blue)	—	NM-NB1-NF-10.0	M to F — 10 M (blue)
—	NM-NB1-NF-04.0	M to F — 4 M (blue)	—	—	

MINI TEES

NM-NF-NF & NM-CF-NF

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A tee is used to tap into the trunk line for adding a drop connection. Two Mini tees are available: a **Mini tee** with Mini connectors for the trunk and drop lines, and a **Mini/Micro tee** with Mini connectors for the trunk lines and a Micro connector for the drop line. Gold contacts for greatest reliability, a mounting hole for secure fastening, waterproof seals, nickel plated brass and keyed connectors.

	Part number	Description	Dimensions
a	NM-NF-NF	Mini tee	Ø26.0 mm (1.02") · 7/8-16UN · clearance for #8 (M4) fastener
—	NM-CF-NF	Mini/Micro tee	Mini trunk, Micro drop

Use the Mini/Micro tee where a Micro drop serves one instrument from a Mini trunk; where the whole run changes size use the NM-CF reducer.

SPECIFICATIONS

Mini cable, cordsets, tees & elbow

Maretron
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Parameter	Value
Cable OD · bend radius · rating · distance	0.41 to 0.49 inches · 7× the cable diameter · 8 amps per network leg · 250 metres (820 feet) between any two points
Connector contacts · coupling nut · thread	Brass / gold · brass / nickel · 7/8-16UN
Gender changer rating	9.0 amps · 600 V
Outer jacket · insulation	PVC/Blue – NB1 · PVC/Gray – NG1 · PE (data), PVC (power)
Construction · shielding	2x15 (1.45 mm) AWG, 2x18 (1.02mm) AWG, 18 (1.02mm) AWG drain wire · shielding (3-Levels): foil overall, foil power pair, foil data pair
Power pair	2x15 (1.45mm) AWG · resistance/conductor 3.44 Ohms/1000 ft max · max amperage 16 Amps (NB1), 14 Amps (NG1) · red/black
Data pair	2x18 (1.02mm) AWG · characteristic impedance 120 Ohms ± 10% · capacitance 12 pF/1000 ft max · white/blue
Field-attachable connector	Housing glass filled nylon/black · contacts brass/gold · coupling nut anodized aluminium · max wire size 14 (1.63mm) AWG · screw terminal · 9.0 Amps, 250 V
Cordset connector	Moulded head and contact carrier thermoplastic PUR/blue-gray · connector outside diameter 1.06" · 9.0 Amps, 300 V · IEC IP68, NEMA 1, 3, 4, 6P · -40°C to 80°C · braid overall, foil power pair, foil data pair
Connector dimensions	78.5 [3.09], 65.0 [2.56], 68.5 [2.70], 88.0 [3.46] · Ø27.0 [1.06] · Ø11.3 [0.44] · 7/8-16 UN · 10-12mm cable diameter · cable .390±.010" × .295±.015"
Cable approvals	UL PLTC 75°C sunlight resistant E90625, AWM 80°C 300 V · CSA CMX-OUTDOOR-CMG LL54185 75°C, AWM I/II A/B 80C 300V FT4
Standards	NMEA 2000® approved · IEC-61162-3
Wire colour code	White NET-H (signal) · blue NET-L (signal) · bare SHIELD (drain) · black NET-C (ground) · red NET-S (power)

Mini terminators, reducer & powertap

TERMINATING THE TRUNK · STEPPING DOWN TO MICRO OR MID · FEEDING BUS POWER THROUGH FUSES

MINI ELBOW & REDUCER

ELB-NM-NF and NM-CF

Maretron
Vessel Monitoring & Control



The Mini elbow is used in spots where it is impossible to bend a cordset around tight corners; it connects to a tee or to double-ended cordsets, making 90 degree turns practical at the end or anywhere along the line.

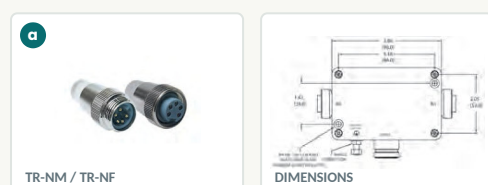
The reducer changes from Mini cable to Micro or Mid cable — for example where the trunk is terminated at the top of a mast but a Mini cable is not wanted up the mast: switch over at the base of the mast and continue with the smaller cable. Corrosion resistant nickel plated brass, weatherproof to IP67.

	Part number	Description	Detail
a	ELB-NM-NF	Mini 90° male to female connector	17.5 mm (0.69") x 28.0 mm (1.10") · Ø26.0 mm (1.02") · 7/8-16UN
b	NM-CF	Mini male to Micro female reducer	Reduces Mini backbone to Micro/Mid cable · IP67

MINI TERMINATION RESISTORS

TR-NM · TR-NF · TRL-NM · TRL-NF

Maretron
Vessel Monitoring & Control



Termination resistors are required on an NMEA 2000® network and are placed at each end of the network trunk cable. Like the double-ended cordsets, the termination resistors are waterproof and continue to function even while submerged in the bilge. **Diagnostic versions with an LED** indicate correct polarity at a glance to ensure power connections have been made properly.

	Part number	Description		Part number	Description
a	TR-NM	Mini termination resistor (male)	—	TRL-NM	Mini termination resistor with LED (male)
—	TR-NF	Mini termination resistor (female)	—	TRL-NF	Mini termination resistor with LED (female)

MINI POWERTAP & MINI POWER CORD

NF-NM4P-NF · NM4P-01 · NM4P-05

Maretron
Vessel Monitoring & Control



A powertap is connected to a network backbone just like any tee, but rather than connecting a device its purpose is to provide "bus" power. Typically it is placed as centrally as possible between the total devices on the backbone. The Maretron powertap uniquely provides **two power inputs**, permitting doubled power provision for devices, and has **replaceable fuses** to protect the bus and connected components from excessive current.

	Part number	Description
a	NF-NM4P-NF	Mini powertap — female-female with fuses
—	NM4P-01	Mini power cord — female to pigtail — 1 metre
—	NM4P-05	Mini power cord — female to pigtail — 5 metre

Colour	Name	Usage	Connector
Black · green	NET-C	Ground	V-1 & V-2
White · red	NET-S	Power	V+1 & V+2

The Mini power cable does not have a shield wire — this connection is made to the screw terminal on the powertap itself. Although Mini cable is rated to 8 amps, the system can support a total load of more than 8 amps: for example 16 amps supplied to the middle of the trunk gives 8 amps to both sides of the powertap, as long as no more than 8 amps is drawn through any single segment.

Gender changers, feed-thru & the N2KMeter®

GETTING BACK TO THE RIGHT CONNECTOR · WATERTIGHT BULKHEADS · THE NETWORK DIAGNOSTIC TOOL

MINI GENDER CHANGERS

NM-NM & NF-NF

Maretron
Vessel Monitoring & Control



Maretron cables have a male connector on one end and a female connector on the other. Normally the male connector points back towards the network power supply, but on some occasions this gets reversed and a gender changer can be used to get back to the desired connector type. Waterproof seals for reliable connections.

	Part number	Description	Protection class
a	NM-NM	Mini gender changer (male/male)	IEC IP67, NEMA 1, 3, 4, 6P · -40°C to 70°C (-40°F to 158°F)
—	NF-NF	Mini gender changer (female/female)	IEC IP67, NEMA 1, 3, 4, 13 · -40°C to 55°C (-40°F to 131°F)

Moulded body and contact carrier thermoplastic PUR / blue-gray · contacts brass / gold · coupling nut brass / nickel · rated current 9.0 amps, rated voltage 600 V · NMEA 2000® approved · IEC 61162-3. Dimensions 73.0 mm (2.87") and 37.3 mm (1.47"), Ø26.0 mm (1.02"), 7/8-16UN; Mini field-attachable connectors accept 10-12mm cable diameter, Ø27.0 [1.06], Ø11.3 [0.44].

MINI BULKHEAD FEED-THRU

BHF-NM-NF

Maretron
Vessel Monitoring & Control



The bulkhead feed-thru allows ease of installation through panels or bulkheads and establishes future connection points in a network installation. It also maintains the integrity of watertight bulkheads by providing a waterproof seal and connection, with rugged keyways for positive alignment of connections. Waterproof rated to **IP67**.

	Part number	Description	Accommodates wall thickness
a	BHF-NM-NF	Mini bulkhead feed-thru	.040" (1.0 mm) to .875" (22.2 mm)

Moulded head thermoplastic PUR / blue-gray · housing brass nickel · contacts brass / gold · gasket nitrile (Buna N) · 600 V DC, 9.0 amps max · 5 × 22 (0.65 mm) AWG · IEC IP67 · -40°C to 105°C (-40°F to 221°F) · NMEA 2000® approved · IEC 61162-3. Supplied with lock washer, locknut, thrust washer and sealing gasket; 7/8-16UN, 49.3 mm (1.94") × 32.7 mm (1.29").

NMEA 2000® DIAGNOSTIC TOOL

N2KMeter®

Maretron
Vessel Monitoring & Control



The N2KMeter® enables trained and untrained personnel to diagnose and troubleshoot network installations quickly and easily. Completely passive on the network, the meter analyses both data and power lines. In seconds, both network-wide and device-specific traffic as well as power monitoring information is captured and displayed on a simple user interface. Data at the boat can be locked in and evaluated later on the bench.

	Part number	Description
a	N2KMeter-01	Diagnostic meter w/1 m Micro cordset

Parameter	Value
Power supply	Network 7–30 V DC < 90 mA · batteries 2 × AA alkaline, approximately 6 hours of operation, 1 year data retention
Connectors · baud rates	Micro connector · 125k, 250k and 500k (auto-detect)
Analogue accuracy	Bus power ±100mV · bus signal ±20mV
Analogue range	Bus power 0 to 25 V with over/under range indication · bus signal -5 to 10 V with over/under range indication
Analogue sample rate	Bus power 1 kHz · bus signal ideal sample point ± 250ns
Signal error threshold	NMEA 2000® spec for network power
Bus load · message rate measurement	Detects bus idle in real time · detects 100% of individual error frames in real time
Approvals	NMEA 2000® approved

Electrician mode (simple): plug in and set the rotary switch to "autosearch", read network health (happy face = healthy, neutral = nominal, sad = faulty), then scroll through faults or freeze and lock settings for review by an NMEA 2000® expert. Expert mode (advanced): scroll through parameters for each active node (MAC ID) — communication errors (rate, cumulative number), bandwidth (% of full usage), power supply and shield voltages, data bit quality (dominant, recessive, +, -, differential voltage, CMV) — and check both numeric values and icons against the limits.

Cable system ordering summary

EVERY MICRO, MID AND MINI PART NUMBER ON ONE PAGE

MICRO / MID SYSTEM

Bulk cable, cordsets, connectors & hardware

Maretron
Vessel Monitoring & Control



Part number	Description	Part number	Description
CG1-10 • CG1-20 • CG1-30	Micro bulk cable 10 / 20 / 30 M (gray)	CM-CF-CF	a Micro tee
CG1-40 • CG1-50	Micro bulk cable 40 / 50 M (gray)	CF-SPWRO5-CF	b Micro/Mid powertap tee
CG1-100C • CG1-750C	Micro bulk cable 100 / 750 M w/spool (gray)	BHF-CM-CF	c Micro bulkhead feed-thru
DG1-10 ... DG1-50	Mid bulk cable 10 / 20 / 30 / 40 / 50 M (gray)	CM-CF-4	d Multiport box
DG1-100C • DG1-600C	Mid bulk cable 100 / 600 M w/spool (gray)	TR-CM • TR-CF	e Micro termination resistor male / female
DB1-10 ... DB1-50	Mid bulk cable 10 / 20 / 30 / 40 / 50 M (blue)	IT-CM-CF	Micro inline terminator
DB1-100C • DB1-600C	Mid bulk cable 100 / 600 M w/spool (blue)	ELB-CM-CF	Micro 90° male to female connector
FA-CF-ST • FA-CM-ST	Micro/Mid field attachable connector, straight female / male	QCM-CG1-QCF-01	Nylon to metal connector cable
FA-CF-90 • FA-CM-90	Micro/Mid field attachable connector, 90° female / male	DF-DB1-25.0	Mid single-ended cordset, F to pigtail, 25 M blue
CM-CG1-CF-00.5 ... -10.0	Micro double-ended cordsets, nine lengths 0.5 to 10 M	N2KMeter-01	Diagnostic meter w/1 m Micro cordset
DM-DG1-DF-00.5 ... -10.0	Mid double-ended cordsets gray, nine lengths	DM-DB1-DF-00.5 ... -10.0	Mid double-ended cordsets blue, nine lengths

MINI SYSTEM

Bulk cable, cordsets, tees, power & terminators

Maretron
Vessel Monitoring & Control

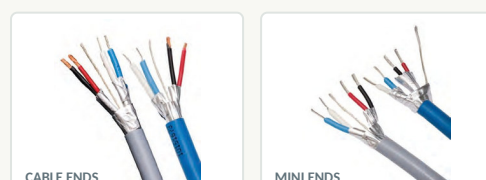


Part number	Description	Part number	Description
NG1-10 ... NG1-50	Mini bulk cable 10 / 20 / 30 / 40 / 50 M (gray)	NM-NF-NF	a Mini tee
NG1-100C • NG1-750	Mini bulk cable 100 M w/spool • 750 M non-continuous (gray)	NM-CF-NF	Mini/Micro tee
NB1-10 ... NB1-40	Mini bulk cable 10 / 20 / 30 / 40 M (blue)	ELB-NM-NF	b Mini 90° male to female connector
NB1-100C • NB1-750	Mini bulk cable 100 M w/spool • 750 M non-continuous (blue)	NM-CF	c Mini male to Micro female reducer
FA-NF-ST • FA-NM-ST	Mini field attachable connector female / male	TR-NM • TR-NF	d Mini termination resistor male / female
NM-NG1-NF-00.5 ... -10.0	Mini double-ended cordsets gray, nine lengths 0.5 to 10 M	TRL-NM • TRL-NF	Mini termination resistor with LED male / female
NM-NB1-NF-00.5 ... -10.0	Mini double-ended cordsets blue, nine lengths 0.5 to 10 M	NF-NM4P-NF	e Mini powertap, female-female with fuses
NM-NM • NF-NF	Mini gender changer male/male • female/female	NM4P-01 • NM4P-05	Mini power cord, female to pigtail, 1 M / 5 M
BHF-NM-NF	Mini bulkhead feed-thru	—	

WIRE COLOUR CODE

What is inside every NMEA 2000® cable

Maretron
Vessel Monitoring & Control



The Mini, Mid and Micro cables contain five wires: one twisted pair (red and black) for 12 V DC power, one twisted pair (blue and white) for signal, and a drain wire (bare). The drain wire shields the signal, power and ground wires from external Radio Frequency Interference and helps reduce RFI emission from the cable.

Colour	Name	Usage
White	NET-H	Signal
Blue	NET-L	Signal
Bare	SHIELD	Drain
Black	NET-C	Ground
Red	NET-S	Power

NMEA 2000® network installation guide

FIVE STEPS — CABLE AND CONNECTOR BASICS · TERMINATORS · POWER · GROUNDING · CHECKING

1. CABLE AND CONNECTOR NETWORK BASICS

Topology & distance rules

Maretron
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The NMEA 2000® cable system uses a **trunk** (backbone) and **drop line** topology. Construct the trunk using double-ended cordsets connected between tees or taps — one end of the cordset has a male connector with male pins, the other a female connector with female receptacles, keyed so they can only connect one way. As an alternative you can make your own trunk line using bulk cable and field-attachable connectors.

To drop off the trunk line you connect a device using a tee connector. **Daisy-chaining of devices is not allowed** — it is a requirement to be able to remove a component from the network without affecting any other device. Multiport boxes are available where instruments tend to be clustered, around the helm for example. Trunk lines can be run up to watertight bulkheads and connected to a waterproof bulkhead feed-thru connector.

Design rule	Limit	Notes
Maximum cable distance, Mini or Mid trunk	250 metres (820 feet)	Between any two points — a point being an electronic product or a terminator
Maximum cable distance, Micro trunk	100 metres (328 feet)	Between any two points
Cumulative drop line length	78 metres (256 feet)	The sum of all drop lines, Mini, Mid or Micro, in the cabling system
Maximum drop line length	6 metres (20 feet)	From any device on a branching drop line to the trunk line
Maximum devices · bend radius	50 physical devices · 7× cable diameter	Disconnection of any device must not interrupt any other device; 7× is the maximum installed bend radius for Micro and Mini

Maximum distance is normally measured between termination resistors — but if a trunk tee is farther from its farthest device than from the nearest terminating resistor, you **MUST** include the drop line length in the maximum cable distance calculation.

2. INSTALLING TERMINATORS & 3. SUPPLYING POWER

Reflections, bus power and voltage drop

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Termination resistors are attached to each end of the trunk cable to reduce reflections of the communication signals. **If you do not use termination resistors as described, the network will not operate properly.** They are typically connected directly to the last tee on the trunk line, although they can be connected to a cordset extending from it; inline terminators are used to terminate the network at the last product.

NMEA 2000® networks can use a power supply originating from a single-point connection to the vessel's 12 volt battery, **or** one or more isolated power supplies distributed along the network — but not a combination of battery and power supply connections. Over-current protection should be provided and sized in accordance with **ABYC E-11 AC and DC Electrical Systems on Boats**, taking into consideration the smallest gauge of cable used for the backbone or drop cables. NET-S is connected to the positive side of the battery, NET-C to the negative side.

Power topic	Rule
Power capability	Mini cable is rated to 8 amps but the system can support more — 16 amps supplied to the middle of the trunk gives 8 amps to both sides of the powertap, as long as no more than 8 amps is drawn through any single segment. Micro/Mid cable is rated to 4 amps and 8 amps to the middle gives 4 amps to each side. Cable resistance may limit the application to less.
End- and middle-powered networks	End-powered networks are typically seen on smaller vessels with only a few devices, with power inserted at one end of the trunk. A middle-powered network is typically found on larger vessels: power is connected somewhere other than the end, giving two legs, one extending in each direction from the insertion point.
Maximum power supply voltage drop	The network is designed to work as long as there is no more than a 1.5 volt difference in supply voltage between any two devices. Voltage Drop = $0.1 \times \text{Network Loads} \times \text{Network Length} \times \text{Cable Resistance} / 100$, where Network Loads is the sum of the Load Equivalent Numbers (LEN) for all devices, Network Length is in metres and cable resistance is in ohms/100 metres.
Interpreting the estimate	Estimates below 1.5 volts across the entire network require no further analysis; estimates between 1.5 and 3 volts require no further analysis as long as a mid-powered network is used. Drops outside these limits require detailed calculations by certified technicians.

Grounding, checking & fault finding

STEPS 4 AND 5 OF THE MARETRON NETWORK INSTALLATION GUIDE, AND THE MOST COMMON NETWORK PROBLEMS

4. GROUND THE NETWORK

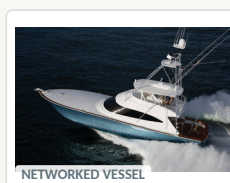
One location, one drain connection



POWERTAP



N2KMETER



NETWORKED VESSEL

The NMEA 2000® network should be grounded at **ONE** location. Grounding at more than one location may produce ground loops, which can cause problems with communications on the network. In addition to the ground wire, connect the drain or SHIELD wire at the supply ground location and NO other place.

Mini powertap wiring: SHIELD (bare) · NET-S left side +12 V (brown) · NET-C left side ground (blue) · NET-S right side +12 V (white) · NET-C right side ground (black). Micro/Mid powertap wiring: NET-C ground (black), NET-C ground (green), NET-S +12 V (white), NET-S +12 V (red).

5. CHECKING YOUR NETWORK

The commissioning checklist



Verify that the network has been correctly designed and installed	
1	Number of devices does not exceed 50
2	Maximum Mini cable distance between any two devices does not exceed 250 metres (820 feet)
3	Maximum Micro/Mid cable distance between any two devices does not exceed 100 metres (328 feet)
4	Maximum cumulative drop line length does not exceed 78 metres (256 feet)
5	No drop should be greater than 6 metres (20 feet)
6	Termination resistors are installed on both ends of the trunk
7	The network is grounded at a single location
8	The SHIELD wire is connected to a single point — the supply ground location

MOST COMMON NETWORK PROBLEMS

What to check when the network misbehaves



Common problem	Detected by the N2KMeter®
More or less than two terminating resistors	Bad termination
Loose connections — make sure all connectors are securely fastened	Intermittent problems
Excessive trunk line length (especially with Micro cable) or excessive drop line cable length	Incorrect topology
Improper shield and ground connection at the power supply	Improper shield connection · common mode voltage
Shorts and opens in field-attachable connectors	Opens and shorts
Failure to perform power distribution calculations for new installations and when adding new devices	Bad nodes
Using a typical device current rather than maximum current for power distribution calculations	Excessive scan rate

Have at least one N2KMeter® available for commissioning: it detects opens and shorts, incorrect topology, bad nodes, bad termination, improper shield connection, intermittent problems, excessive scan rate and common mode voltage.

Maretron suggests you consult a trained professional for any installation. Learn more from the National Marine Electronics Association at www.nmea.org, the NMEA 2000® Standard for Serial-Data Networking of Marine Electronic Devices, and the NMEA Installation Standards.

WHAT A COMMISSIONED NETWORK NEEDS

The parts that make the checklist pass



TR-CM / TR-CF



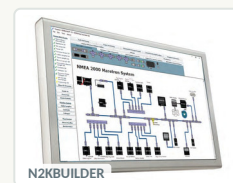
TR-NM / TR-NF



MINI TEES



GENDER CHANGERS



N2KBUILDER

Design the network in N2KBuilder® V3 first — it validates the topology against these rules and produces the Maretron Bill of Materials, then exports the configuration to N2KAnalyzer® V3 for commissioning.

Load Equivalence Numbers & power budget

1LEN = 50mA — SUM THE LEN OF EVERY DEVICE TO SIZE THE NETWORK POWER SUPPLY

LEN AND SUPPLY DATA BY PRODUCT

The complete Maretron network load table



Product	Operating voltage	Consumption	LEN	Protection & class
WSV100	8–32 V DC (NMEA 2000®) · 9–32 V dedicated	50 mA · 5 W	1	IP67 · -20°C to 70°C
TSM810C	8–32 V DC (NMEA 2000®) · 10–32 V dedicated	50 mA · 10 W typ	1	IP66 front / IP22 rear · IEC 60945
MBB300C	8–32 V DC (NMEA 2000®) · 9–36 V dedicated	80 mA · 10 W max	1	-20°C to 70°C
DSM410	9 to 30 Volts	250mA max	1	IP67 · exposed
DSM570	9 to 30 Volts	4.5 W max	9	IP67 · exposed
ALM100	9 to 32 Volts	100mA	2	IP67 · exposed
USB100	9 to 32 Volts	< 50mA	1	IP67 · exposed
IPG100	9 to 32 Volts	< 150mA	3	IP67 · exposed
J2K100	9 to 32 Volts	< 150mA	3	IP67 · exposed
NBE100	9 to 32 Volts	< 150mA	3	IP67 · exposed
FPM100	9 to 32 Volts	400mA	8	IP64 · exposed
TLM100	9 to 16 Volts	< 100mA	2	IP67 · exposed
TLM150	9 to 16 Volts	< 100mA	2	IP67 · exposed
TLA100	9 to 16 Volts	< 100mA	2	IP67 · exposed
FFM100	9 to 32 Volts	150mA	3	IP64 · exposed
CLM100	9 to 32 Volts	400mA	8	IP64 · exposed
ACM100	9 to 32 Volts	50mA	1	IP64 · exposed
DCM100	9 to 32 Volts (NMEA and battery interfaces)	50mA network · 70mA battery	1	IP64 · exposed
DCR100	9 to 32 Volts	150mA	3	IP64 · exposed
RIM100	9 to 32 Volts	50mA	1	IP64 · exposed
SIM100	9 to 32 Volts	100mA	2	IP64 · exposed
RAA100	9 to 16 Volts	< 50mA	1	IP67 · exposed
TMP100	9 to 32 Volts	< 50mA	1	IP64 · exposed
VDR100	9 to 32 Volts	< 200mA	4	IP67 · exposed
WSO200	9 to 32 Volts	< 50mA	1	IP67 · exposed
GPS200	9 to 32 Volts	< 150mA	3	IP67 · exposed
SSC300	9 to 16 Volts	< 50mA	1	IP67 · exposed
DST110	9 to 32 Volts	< 200mA	4	IP68 · submerged
CLMD12	12 / 24 V DC systems	150 mA @ 12 V · 70mA @ 24 V	3	IP67 · ignition protected
CBMD12	12 / 24 V DC systems	50mA	1	ATC standard fuses
CLMD16	12 / 24 V DC systems	50mA	1	IP67 · ignition protected
VMM6	9 to 32 Volts	150mA	3	IP68 front panel
CKM12	8 to 32 Volts	150mA	3	IP69K front · IP68 back

All Maretron products are reverse battery protected indefinitely and load dump protected, energy rated per SAE J1113. Environmental qualification to IEC 60945, quoted as Maretron publishes it: relative humidity 93%RH @ 40° per IEC60945-8.2 · vibration 2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s² per IEC 60945-8.7 · rain and spray 12.5mm nozzle @ 100liters/min from 3m for 30min per IEC 60945-8.8 · solar radiation ultraviolet B, A, visible and infrared per IEC 60945-8.10 · corrosion (salt mist) 4 times 7days @ 40°C, 95%RH after 2 hour salt spray per IEC 60945-8.12 · electromagnetic emission per IEC 60945-9 · immunity per IEC 60945-10 · safety precautions per IEC 60945-12. MPower® modules additionally qualify to EN 60068-2-5, 60068-2-6, 60068-2-52 and 60068-2-78, and carry the CE mark to Recreational Craft Directive 2014/35/EU.

Nameplate and label part numbers seen on the products themselves: RAA100 P/N M000066, NMEA 2000 LEN: 1 · VMM6 label VMM-00000009 with date code and serial number fields · FFM100 accuracy is quoted against K factors programmed into the FFM1000 meter head · DCM100 current transducers are the LEMHTAx00-S family (LEMHTA200-S, LEMHTA400-S, LEMHTA600-S) · FPM100 and CLM100 pressure transducers are illustrated as PT-0-xxxPSI-01 and PTS-0-x.xPSI-01 · TLM100 and TLM150 tank adapters are illustrated as TA-5H-x and focus tubes as TFT-x · the TSM810C dust cover spare is TSM810C-01-Dust-Cover · the VDR100 flash drive is shown as MO03029 in the accessory illustration and listed as M003029 in the ordering table.

NMEA 2000® Parameter Group Numbers

EVERY PGN TRANSMITTED OR ANSWERED BY A MARETRON PRODUCT, WITH THE PRODUCT THAT USES IT

PERIODIC DATA PGNS

Measurement and status messages



PGN	PGN name	PGN	PGN name
126992	System time	129025	Position, rapid update
126993	Heartbeat	129026	COG and SOG, rapid update
127245	Rudder	129029	GNSS position data
127250	Vessel heading	129538	GNSS control status
127251	Rate of turn	129539	GNSS DOPs
127257	Attitude	129540	GNSS satellites in view
127258	Magnetic variation	129541	GPS almanac data
127488	Engine parameters, rapid update	130306	Wind data
127489	Engine parameters, dynamic	130310	Environmental parameters
127493	Transmission parameters, dynamic	130311	Environmental parameters
127497	Trip parameters, engine	130312	Temperature
127498	Engine parameters, static	130313	Humidity
127500	Load controller connection state & control	130314	Actual pressure
127501	Binary status report / binary switch bank status	130316	Temperature, extended range
127505	Fluid level	130576	Trim tab status
127506	DC detailed status	128259	Speed (water referenced)
127508	Battery status	128267	Water depth
127513	Battery configuration status	128275	Distance log
127751	DC voltage / current	128720	Proprietary alarm status

PROTOCOL, REQUESTED & PROPRIETARY PGNS

Network management and Maretron extensions



PGN	PGN name	PGN	PGN name
055904	ISO request	130818	Device label (Maretron proprietary)
059392	ISO acknowledge	130823	Temperature, high range (exhaust gas)
059904	ISO request	130824	Annunciator
060160	ISO transport protocol, data transfer	130825	Maretron proprietary
060416	ISO transport protocol, connection management	130828	Dometic HVAC status
060928	ISO address claim	130830	Dometic icemaker status
061184	Device configuration information	130832	Alert operating mode
065240	ISO address command	130836	Switch status counter (Maretron proprietary)
065286	Fluid flow rate (Maretron proprietary)	130837	Switch status timer (Maretron proprietary)
065287	Trip volume (Maretron proprietary)	130840	Generic sensor (Maretron proprietary)
065300	Carling flash table configuration response	130921	Carling proprietary
126208	NMEA request / command / acknowledge	130060	Label
126464	PGN list (transmit and receive)	65284	DC breaker current (Maretron proprietary)
126720	Device configuration information / Carling proprietary	65300	Carling proprietary
126996	Product information	126998	Configuration information

AC measurement PGNs & product cross-reference

WHICH MARETRON PRODUCT TRANSMITS WHICH PARAMETER GROUP — FOR NETWORK DESIGN AND TROUBLESHOOTING

ACM100 AC MEASUREMENT PGNS

Bus, utility and generator quantities



PGN	PGN name	Default rate
65001-65003	Bus phase A-C basic AC quantities	Disabled
65004	Bus average basic AC quantities	2 times/second
65005	Utility total AC energy	2 times/second
65006-65014	Utility phase A-C power and basic quantities	Disabled
65015 · 65016 · 65017	Utility total AC reactive power · utility total AC power · utility average basic AC quantities	2 times/second
65018	Generator total AC energy	2 times/second
65019-65027	Generator phase A-C power and basic quantities	Disabled
65028 · 65029 · 65030	Generator total AC reactive power · generator total AC power · generator average basic AC quantities	2 times/second

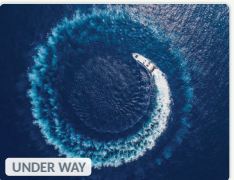
J1939 diagnostic messages 65226 to 65236 are passed by the J2K100 gateway. AC measurement range 0–380 VAC line-to-neutral at ±1%, current 0-100 A with the included transducer (0 to 400 A optional) at ±1%, frequency 30-80Hz at 0.5 Hz typical.

PRODUCT TO PGN CROSS-REFERENCE

What each device puts on the bus



Product	Periodic data PGNs transmitted
ALM100	128720 proprietary alarm status · 130824 annunciator
J2K100	127488 · 127489 · 127493 · 127497 · 127498 · 130828 · 130830
FPM100	127505 fluid level · 130314 actual pressure · 130840 generic sensor
TLM100 · TLM150 · TLA100	127505 fluid level
FFM100	127489 engine parameters dynamic · 127497 trip parameters engine · 065286 fluid flow rate · 065287 trip volume
CLM100	127488 · 127489 · 127493 · 127508 · 127751 · 130840 generic sensor
ACM100	65001-65003 · 65004 · 65005 · 65006-65014 · 65015–65018 · 65019-65027 · 65028–65030
DCM100	127506 DC detailed status · 127508 battery status · 127513 battery configuration status
DCR100 · RIM100 · SIM100	127501 binary status report · 130836 switch status counter · 130837 switch status timer
RAA100	127245 rudder
TMP100	130310 · 130311 · 130312 temperature · 130316 temperature extended range · 130823 temperature high range (EGT)
WSO200	130306 wind data · 130310 · 130311 · 130313 humidity · 130314 actual pressure
GPS200	126992 system time · 127258 magnetic variation · 129025 · 129026 · 129029 · 129538 · 129539 · 129540 · 129541
SSC300	127250 vessel heading · 127251 rate of turn · 127257 attitude
DST110	128267 water depth · 128259 speed (water referenced) · 128275 distance log · 130310 · 130311 · 130312
CLMD12 · CLMD16	126993 heartbeat · 127500 load controller connection state & control · 127501 · 127751 · 130060 label · 65284 DC breaker current
VMM6 · CKM12	126993 heartbeat · 127501 binary status report · 126720 and 65300 Carling proprietary · 130921 Carling proprietary
NBE100	Routes and filters any PGN between network segments — specify PGN numbers to be passed or blocked
TSM810C · MBB300C · WSV100	Receive every PGN on the bus for display; command 127500 and 127501 for digital switching control
DSM410 · DSM570	Receive and display all instrument, navigation and monitoring PGNs except AIS; command switching PGNs
USB100 · IPG100	Bridge all PGNs to USB or Ethernet; USB100 also converts to NMEA 0183 sentences
All products	126464 · 126996 · 126998 on request · 055904 · 059392 · 059904 · 060160 · 060416 · 060928 · 061184 · 065240 · 126208 protocol · 126720 · 130818 · 130832 Maretron proprietary



Custom Marine designs Maretron networks in N2KBuilder®, supplies the validated bill of materials and commissions the installed bus with an N2KMeter® — 800BOATS.

Simarine — the complete system

SIMARINE D.O.O., MARIBOR, SLOVENIA — MONITORING, CONTROL AND DIGITAL SWITCHING FOR YACHTS AND CAMPERVANS

FOUR CONTROL PLATFORMS

Nereide 2, Nereide Pro, PICO and VIA



Every Simarine system is built the same way: a **display or control panel** that carries the user interface, a **power unit** that switches the loads, and any number of **SiCOM expansion modules** that add shunts, tank inputs, temperature inputs, inclination and NMEA 2000 output.

All four platforms share the same PICO monitoring engine, the same expansion modules and the same Simarine mobile app, so a system can start as a battery monitor and grow into full digital switching without replacing anything.

	Platform	Role	Power unit	Switching	Monitoring built in
a	Nereide 2	Yacht control panel, 210 × 210 mm	SPU-303 / SAC23	18 + 1 physical buttons	Full PICO monitoring
b	Nereide Pro	Yacht control panel, 270 × 200 mm	SPU-303 / SAC23	20 physical + 200 virtual	Full PICO monitoring
c	PICO	Battery, tank and appliance monitor	SPDU-52 / SPDU-66 optional	With SK8 keypad + SPDU	Batteries, tanks, temperature, barograph
d	VIA	Campervan and small-craft touch panel	SPDU-52 / SPDU-66	6 control + 1 display button	Batteries, tanks, temperature, inclination

TWO BUSES

SiCAN and SiCOM — how a system is wired



SiCAN carries panel-to-power-unit traffic: one cable from the Nereide control panel to the SPU-303 DC unit, to the SAC23 AC units and to the SRB530 remote-switch unit. **SiCOM** is the module bus — every shunt, tank module, inclinometer and gateway carries two SiCOM ports so modules daisy-chain from one another and are powered from the same cable.

Load wiring on the DC and AC units uses standard **WAGO®** spring-cage connectors, so no crimp tooling is required on site and the control panel can be installed separately from the power unit.

Bus	Carries	Devices on the bus	Cable supplied
SiCAN	Panel to power unit, switching commands and feedback	Nereide 2 / Nereide Pro panel, SPU-303, SAC23M-RCBO, SAC23R-RCBO, SRB530	Single SiCAN cable
SiCOM	Measurement modules, daisy-chained, powered over the bus	SC303, SC503, SCQ25, SCQ25T, SCQ50, ST107, SDI01, SN01, SK8, STP-06	5 m data cable per module
NMEA 2000	Vessel network — batteries, tanks, temperatures, pressure, switch bank	SN01 gateway (backbone drop, Micro-C)	Standard N2K drop
Wi-Fi	Simarine app, firmware upgrade, remote access via router	PICO, VIA, Nereide 2, Nereide Pro — 2,4 GHz	—

MONITORING CAPACITY

What one Simarine system can see



Measured item	Maximum	Provided by	Input range
Battery banks	6	SC303 / SC503 high-amp shunts, ST107 voltage inputs	0 - 75 VDC
Shunts (current channels)	24	SC303, SC503, SCQ25, SCQ25T, SCQ50	0.01 - 500 A
Temperature sensors	10	SC303, SC503, SCQ25T, ST107 — NTC 1k, NTC 5k, NTC10K	-40 °C to +150 °C
Tank level sensors	14	ST107, SCQ25T, SC303 resistance and voltage inputs	0-65K ohms / 0-75V
Inclinometer modules	2	SDI01 digital inclinometer	±89° pitch and roll
SPU-303 DC power units	10	Nereide 2 and Nereide Pro control panels	SiCAN

Logger: 1200 days of battery history (more than 3 years) and 100 days of shunt history, up to 20 current channels. Battery chemistry support: LiFePO4, AGM, GEL, Deep Cycle, Wet Free and Wet Low. All platforms take the same SiCOM modules — SC303, SC503, SCQ25, SCQ25T, SCQ50, ST107, SDI01 and SN01.

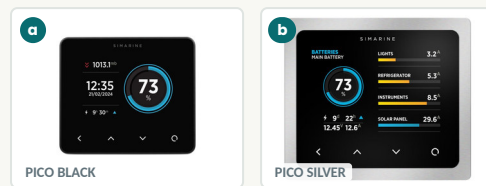
Custom Marine specifies, supplies and commissions complete Simarine systems from Dubai — panel, power unit, shunts, sensors and cabling as one order, with the configuration file built before the parts ship.

PICO battery monitoring system

SIMARINE PICO — MODULAR SYSTEM FOR MONITORING BATTERIES, TANKS AND MORE

FOUR VERSIONS

2 colour types × 2 mount types



The PICO battery monitor displays voltage, state of charge, remaining ampere hours, time to charge or discharge and temperature for up to **6 battery banks**. The system is modular — the monitor needs at least one expansion module; for battery monitoring that is the shunt **SC303** or **SC503**.

The IP67-rated anodised aluminium unibody case is water and dust resistant. The optically bonded 3.5" IPS display carries Gorilla® Glass, a polarising filter and automatic illumination; the CapSense® touch buttons still work with water on them.

	Order as	Colour	Mount	Dimensions without connector	Screen
a	PICO standalone, black	Black anodised	Standalone / surface	98 × 84 × 10 mm · 3.85 × 3.30 × 0.39 in	3.5" IPS
b	PICO standalone, silver	Silver anodised	Standalone / surface	98 × 84 × 10 mm · 3.85 × 3.30 × 0.39 in	3.5" IPS
—	PICO panel-mount, black	Black anodised	Panel / flush	108.5 × 94 × 10 mm · 4.27 × 3.70 × 0.39 in	3.5" IPS
—	PICO panel-mount, silver	Silver anodised	Panel / flush	108.5 × 94 × 10 mm · 4.27 × 3.70 × 0.39 in	3.5" IPS

State the colour and mount type when ordering. All four versions are electrically and functionally identical.

ELECTRICAL DATA

PICO operating and display specification

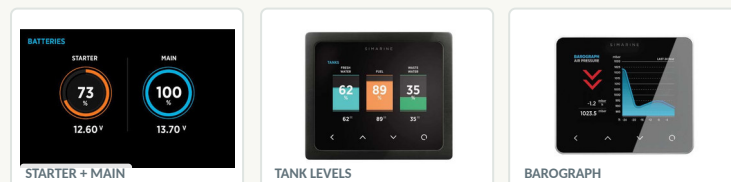


PICO is compatible with **LiFePO4**, **AGM**, **GEL**, **Deep Cycle**, **Wet Free** and **Wet Low** battery types and can watch several voltage systems at once. The standard splitter supplied with PICO covers 12 V and 24 V systems; a **high-voltage splitter** is required for systems that run exclusively on 48 V.

Parameter	Value	Parameter	Value
Power source voltage range	6 - 35 VDC	Current range	-999.99 to +999.99 A
Temperature range	-20 °C to 70 °C (-4 °F to 158 °F)	Current resolution	0,01 A
Operating, WiFi on, 100 % illumination	90 mA	Voltage range	0 - 75 VDC
Operating, WiFi off, 70 % illumination	35 mA	Voltage resolution	0,001 V
Operating, WiFi off, 0 % illumination	18 mA	Amp hours	±0,1 Ah
Power off, logger still active	5 mA	Temperature range / resolution	-40 °C to +150 °C / 0,1 °C / °F
Radio frequency band	2,4 GHz	SOC — state of charge	0 - 100 %

REAL-TIME DATA

What PICO puts on the screen



The built-in **barograph** displays air pressure in real time, detects change and stores the trend — invaluable for predicting weather. Up to **12 temperature sensors** may be added through SC303, SC503, SCQ25T and ST107 modules; PICO is compatible with NTC sensors.

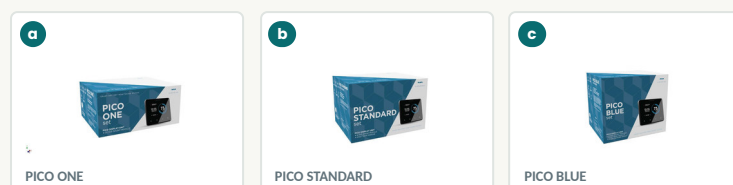
Screen	Shows	Needs module
Batteries	Voltage, current, state of charge, remaining Ah, time to go, compartment temperature	SC303 or SC503
Devices	Individual consumers and generators — fridge, lights, cooktop, coffee maker, solar	SCQ25, SCQ25T or SCQ50
Tanks	Up to 12 tanks, two calibration points minimum, more for irregular shapes	ST107 or SCQ25T
Temperatures	Cabin, outside, battery, fridge and engine temperatures	SC303 / SC503 / SCQ25T / ST107
Barograph	Air pressure, trend and history	Built in
Inclinometer	Pitch and roll, 0,1° resolution	SDI01
History	1200 days of battery data, 100 days of shunt data, 20 current channels	Built in

PICO sets — boxed systems

PICO ONE · PICO STANDARD · PICO BLUE — MONITOR, SHUNT AND MODULES IN ONE CARTON

THREE BOXED SETS

PICO One, PICO Standard and PICO Blue



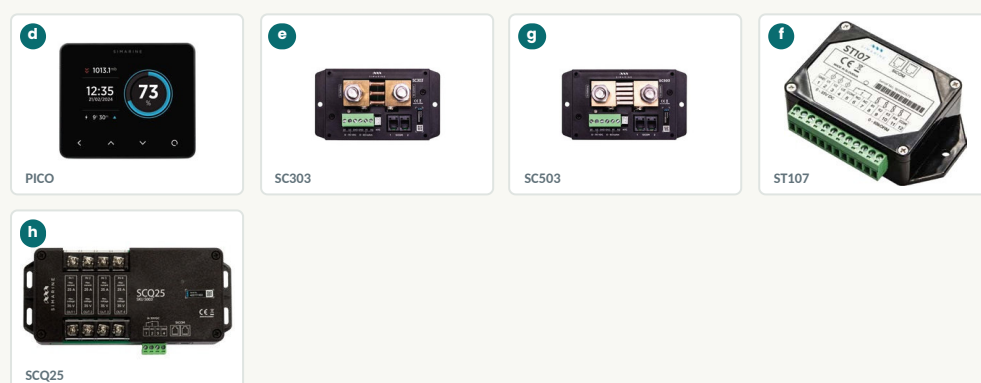
PICO One is entry-level battery monitoring — the service battery bank plus one additional battery such as the engine battery or a voltage-type tank sensor, and up to two temperatures or resistive tank sensors.

PICO Standard adds the ST107, taking the system to four additional batteries or voltage-type tank sensors and six temperatures or resistive tank level sensors. **PICO Blue** is the most popular set: a 500 A shunt plus the quadro shunt so that four consumers or generators are metered individually.

	Set	Monitor	Shunt	Modules	Monitors
a	PICO ONE SET	PICO battery monitor	SC303 combo shunt, 300 A	—	Service bank + 1 battery, 2 temperatures or resistive tanks
b	PICO STANDARD SET	PICO battery monitor	SC303 combo shunt, 300 A	ST107 tank level module	Service bank + 4 batteries or voltage tanks, 6 temperatures or resistive tanks
c	PICO BLUE SET	PICO battery monitor	SC503 combo shunt, 500 A	ST107 tank level module + SCQ25 quadro shunt	As Standard, plus 4 devices metered individually

SET CONTENTS

Individual parts inside each set

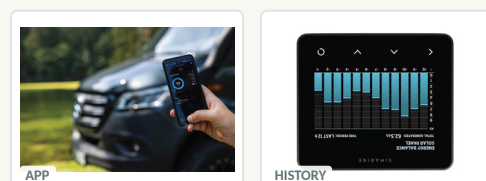


Each item is sold separately, so a set can be built from stock or extended on the same order.

	Item	Function	One	Standard	Blue
d	PICO	Battery monitor / display unit	✓	✓	✓
e	SC303	Combo shunt, 300 A continuous, 2 voltage + 2 resistance inputs	✓	✓	—
g	SC503	Combo shunt, 500 A continuous, 2 voltage + 2 resistance inputs	—	—	✓
f	ST107	Tank level and voltage module, 4 resistance + 3 voltage inputs	—	✓	✓
h	SCQ25	Quadro shunt, 4 × 25 A appliance channels	—	—	✓

APP, REMOTE AND HISTORY

Simarine mobile app and remote access



The free Simarine mobile app connects to PICO for live data on batteries, tanks, temperatures, barograph, small-appliance consumption and auxiliary generators, and is also used to **configure PICO and upgrade its firmware**.

Connect PICO to the internet through the boat, marina or campsite router and the same data is available remotely from anywhere.

Function	Detail	Requires
Live data	Batteries, tanks, temperatures, barograph, appliance consumption, generators	Wi-Fi Direct (localhost)
Configuration	Sensor setup, tank calibration points, alarm thresholds, button assignment, firmware upgrade	Simarine app
Remote access	Full data from anywhere	Router, marina or camp Wi-Fi
History	1200 days of battery data; 100 days of solar, charger, fridge and lighting data	Built in

PICO switching — SK8 and SPDU

MONITORING PLUS FUSED DC SWITCHING FROM ONE INTERFACE — PICO + SK8 + SPDU-52 OR SPDU-66

SYSTEM 1

PICO + SK8 + SPDU52



PICO with SK8 and SPDU52 delivers precision battery monitoring and fused six-channel DC switching — complete with manual override and seamless expansion to tanks, temperatures and more — on one sleek, dependable interface.

The SPDU52 provides **6 switching channels across 12 fuses**, a 50 A shunt for the service battery, a 40 A shunt for the wall charger, a 16 A shunt for solar and 50 A for the DC/DC charger.

Part	Description	Key capacity
PICO	Battery monitor and user interface, 3.5" IPS, IP67-rated	6 banks, 24 shunts, 14 tanks
SK8	Simarine digital keypad, 8 programmable backlit buttons	SiCOM, 8 - 35 VDC
SPDU-52	12 V distribution unit, 6 relays across 12 fuses, integrated shunts	50 A combined output

SYSTEM 2

PICO + SK8/3rd party switches + SPDU66



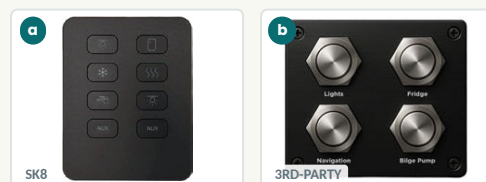
Pair PICO with SK8 — or your existing 3rd-party switches — and the SPDU66 for six fused DC switching channels, six digital inputs, a built-in 100 A main shunt and integrated charger and solar shunts, delivering tactile control with advanced PICO monitoring and full Simarine expandability.

Part	Description	Key capacity
PICO	Battery monitor and user interface	6 banks, 24 shunts, 14 tanks
SK8	Simarine digital keypad — or 3rd-party switches on the digital inputs	8 buttons, feedback from SPDU relays
SPDU-66	DC distribution unit, 6 switchable fused relays + 1 fixed fused output	100 A combined, 6 digital inputs

Traditional switches connect to the SPDU-66 digital inputs with feedback information, so mechanical switches and the SK8 keypad can be mixed on the same system.

SK8 KEYPAD

Simarine digital keypad, 8 buttons



Designed to integrate into Simarine's modular marine systems, the SK8 keypad is a compact expansion module for controlling digital switching across SPDU-66 and SPDU-52 units. Eight fully programmable backlit buttons give tactile control of lighting, pumps, fans and other 12 V DC appliances.

Intended for interior and cabin installation, it connects over the **SiCOM** bus to PICO, VIA, SPDU66 or SPDU52 units. Multiple keypads can be installed across the vessel for centralised or distributed control with feedback from the SPDU relays. Each button can be assigned to a single output or to several.

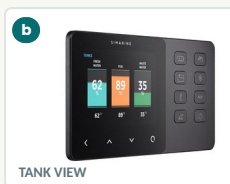
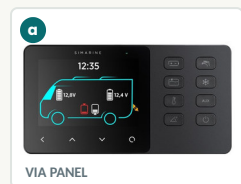
	Parameter	Value	Parameter	Value
a	Voltage range	8 - 35 VDC	Button configuration	8 programmable backlit buttons
	Power consumption at 12 V	10 mA (OFF) / 35 mA (ON)	Material	Anodised aluminium enclosure
	Response time	100 ms	Dimensions (l × w × d)	82 × 63 × 22,6 mm
b	Connectivity	SiCOM	3rd-party switches	Via SPDU-66 digital inputs, with feedback

VIA monitoring & control system

SIMARINE VIA — MONITORING AND CONTROL SYSTEM WITH DIGITAL SWITCHING FOR CAMPERVANS AND SMALL CRAFT

VIA CONTROL PANEL

The command centre of the VIA system



The panel is the user interface of the VIA system — the command centre, allowing configuration and status of the appliances, sensors and batteries being monitored. Seven buttons are available: **6 control buttons and 1 display button**, each freely assigned to a relay or group of relays.

Configure the POWER OFF button so that the panel switches to **sleep mode**: the control panel then uses only 5 mA while still gathering all data on the back side. In normal operation with Wi-Fi off and 70 % illumination it consumes 40 mA.

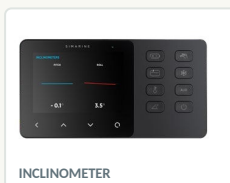
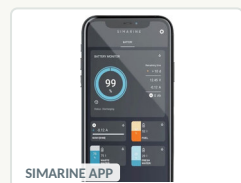
The VIA system is expandable with all modules from the PICO system.

	Parameter	Value	Parameter	Value
a	Voltage range	6 - 22 VDC	Current range / resolution	-999.99 to +999.99 A / 0.01 A
	Temperature range	-20 °C to 70 °C (-4 °F to 158 °F)	Voltage range / resolution	0 - 75 VDC / 0,001 V
	Operating, WiFi on, 100 % illumination	100 mA	Amp hours	±0,1 Ah
	Operating, WiFi off, 70 % illumination	40 mA	Temperature range / resolution	-40 °C to +150 °C / 0,1 °C / °F
	Operating, WiFi off, 0 % illumination	22 mA	SOC — state of charge	0 - 100 %
b	Power off, logger still active	5 mA	Radio frequency band	2,4 GHz
	Control panel dimensions	157.10 × 82.10 × 5.60 mm · 6.18 × 3.23 × 0.22 in	Connectivity	SiCOM

Panel versions compatible with Lippert/Schaudt EBL 20 and EBL 211 distribution units are available on request. Lippert and Schaudt are trademarks of Lippert Components, Inc. and LCI Industries.

WHAT THE VIA SYSTEM COVERS

Connectivity of the control panel



All you need to monitor batteries, tanks, temperatures, refrigerator, cooktop and solar, and to manage water pump, fridge, heating and lighting. Add expansion modules and the system also monitors service batteries at higher voltage levels — but the switching unit always needs a constant 12 V supply.

Connectivity, up to	Qty	Notes
Battery banks	6	SPDU52 alone monitors one 12 V service battery; expansion modules add the rest
Shunts	24	SC303/503, SCQ25, SCQ25T, SCQ50 and the SPDU internal shunts
Temperature sensors	10	NTC 1k, NTC 5k and NTC10K types
Tank level sensors	14	Resistive 0 - 65 kOhm or voltage 0 - 75 V, two 4-stage sensors on the SPDU
Inclinometer modules	1 - 2	SDI01, plug and play, pitch and roll on the VIA panel or the phone app

ALARMS

Programmable alarm relay on every expansion module



Expand the system with the ST107 tank level and voltage module, the SCQ25, SCQ50 or SCQ25T and alarms become available for any measurement. Each of these modules carries an **integrated programmable 12 V alarm signal relay** configured to output a signal of 1 A in the event of an alarm. In the settings, select the device, the upper and lower threshold values, the alarm duration and the delay.

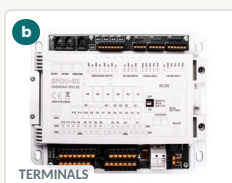
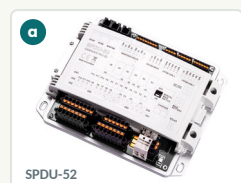
Alarm can be triggered on	Alarm can be triggered on	Alarm can be triggered on
State of charge	Voltage input measurement	Barometric trend
(Battery) time to go	Current input measurement	Temperature
Tank level	Alarm relay voltage limit 60 V	Alarm relay current limit 1 A

SPDU-52 12 V distribution unit

SIX SWITCHING CHANNELS ACROSS TWELVE FUSES — WITH INTEGRATED SERVICE, CHARGER, SOLAR AND DC/DC SHUNTS

12V DISTRIBUTION UNIT

SPDU52



The VIA control panel comes together with the SPDU52 12 V power distribution unit. It is a versatile module equipped with **6 switching channels distributed across 12 fuses**, a 50 A shunt for the service battery, 40 A shunt for the wall charger, a 16 A shunt for solar and 50 A for the DC/DC charger.

The SPDU52 alone suits smaller projects. For bigger projects add expansion modules such as SC303/503, ST107, SCQ25 and other high-amp devices; the modules are powered from the SPDU52 unit.

	It allows monitoring of	Range	And provides
a	The solar input — channel 1, isolated shunt	0 - 16 A	6 relays for controlling 12 V devices
	The charger input — channel 2, isolated shunt	0 - 40 A	4 resistance inputs
	The service battery — channel 3, "Main battery"	0 - 50 A	2 voltage inputs
b	The starter battery — channel 4	0 - 50 A	Two 4-stage tank level sensors
	The DC/DC charger terminal, separate shunt	50 A max	Charging from the alternator, monitored independently

Connect all consumers and generators through the SPDU for accurate battery monitoring. With a main and a starter battery connected, voltage is measured automatically and the two voltage inputs stay free for extra sensors. Any panel button can be configured to a chosen relay, and one relay can drive several devices.

OUTPUT CHANNELS — NO FIXED LOAD PER CHANNEL

SPDU-52 relay ratings and sensor inputs



Output channel	Max continuous current	Sensor input	Range
K1	20 A	Voltage channel 1 (starter battery bank)	0 - 22 V
K2	20 A	Voltage channel 2 (main battery bank)	0 - 22 V
K3	15 A	Voltage channel 3 (U3)	0 - 75 V
K4	15 A	Voltage channel 4 (U4)	0 - 75 V
K5	10 A	Resistance inputs R1, R2, R3, R4	0 - 65 kOhm, ±3 %
K6 · all combined	10 A · 50 A limit	Temperature sensor NTC 10K · voltage accuracy / resolution / rate	-13°C to +80°C, ±3,0 % · ±0,3 % / 1 mV / 100 ms

SPDU-52 SPECIFICATION

Operating data



Parameter	Value	Parameter	Value
Voltage range	8 - 22 VDC	Current measuring accuracy	±1 %
Main battery / starter battery	8 - 22 VDC	Current sample rate	100 ms
Temperature range	-20 °C up to 70 °C	Current resolution	±0.01 A
Power consumption at 12 V, operating	15 mA	Dimensions without connector	200 × 160 × 42 mm · 7,87 × 6,3 × 1,65 in
Power consumption at 12 V, power off	0,25 mA	Connectivity	SiCOM

MULTIPLE POWER SOURCES

Charger, solar and DC/DC terminals



The power distribution unit features two dedicated sockets with **isolated shunts for the charger and solar inputs**, enabling precise independent monitoring of each. A separate shunt for the DC/DC charger allows individual monitoring, giving comprehensive oversight of the battery management system.

Source	Max continuous	Shunt	Monitored value
Solar input	16 A	Isolated, dedicated socket	Charge current from the array
Charger input (shore / wall)	40 A	Isolated, dedicated socket	Charge current from the mains charger
DC/DC charger terminal	50 A	Integrated, independent	Alternator charge current

SPDU-66 DC distribution unit

SIX FUSED RELAYS, FOUR HIGH-CURRENT SHUNTS, SIX DIGITAL INPUTS AND THERMOSTAT CONTROL IN ONE MODULE

DC DISTRIBUTION UNIT

SPDU66



SPDU-66



TERMINAL FACE

The Simarine SPDU-66 is a compact and intelligent 12 V DC distribution unit built to integrate with Simarine's VIA or PICO panels. Six switchable fused relays plus one fixed fused output, four high-current shunts (30 - 50 A) for batteries, chargers and solar, six digital inputs for traditional switch integration with feedback, and four resistance plus four voltage sensor inputs for tank and temperature monitoring.

A built-in digital output handles **thermostat control for up to 4 zones**. Manual override switches on each relay give failsafe operation, and diagnostic LEDs indicate fuse failure or output status.

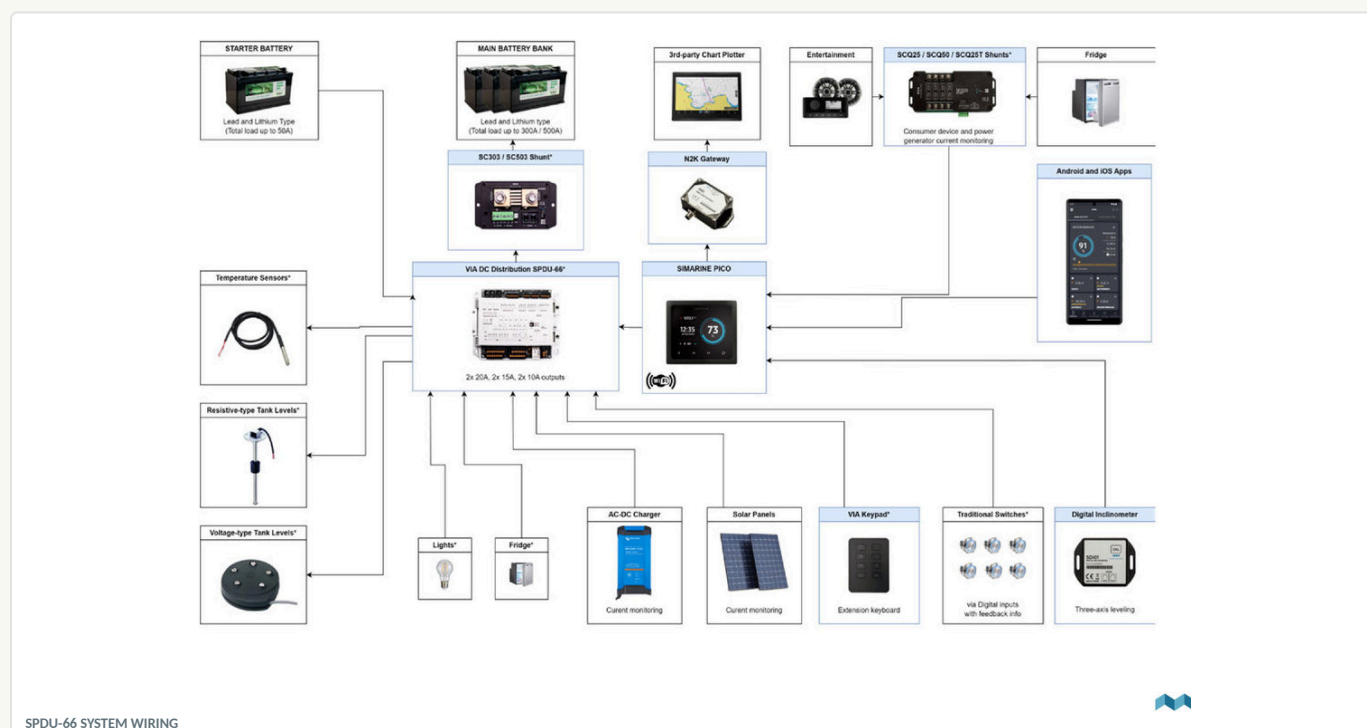
Ideal for mid-size RVs, mid-sized yachts, sailboats, expedition vehicles or any 12 V DC system with lithium or lead-acid batteries and solar charging.

	Channel	Max continuous	Current measuring	Range	Voltage measuring	Range
a	K1	20 A	Channel 1 (solar)	0 - 50 A	Channel 1 (DC/DC input)	0 - 22 V
	K2	20 A	Channel 2 (charger)	0 - 50 A	Channel 2 (main battery bank)	0 - 22 V
	K3	15 A	Channel 3 (main battery)	0 - 50 A	Channel 3 (U3)	0 - 75 V
	K4	15 A	Channel 4 (DC/DC)	0 - 50 A	Channel 4 (U4)	0 - 75 V
b	K5	10 A	Accuracy / resolution	±1 % A / ±0,1 % A	Accuracy / resolution	±0,3 % / 1 mV
	All combined	100 A	Sampling rate	100 ms	Sampling rate	100 ms

Input channels: digital input 1 - 6, toggle or momentary. Resistance inputs R1, R2, R3, R4: 0 - 65 kOhm, ±3 %. Temperature sensor NTC 10k: -13 °C to 80 °C, ±3 %. Voltage range 8 - 22 VDC; operating consumption 15 mA at 12 V, 0,25 mA power off. Dimensions 200 × 160 × 42 mm. Connectivity SICOM.

WIRING EXAMPLE

A complete VIA / PICO system around the SPDU-66



SPDU-66 SYSTEM WIRING



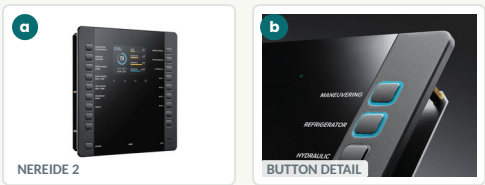
Multiple units or modules can be added to the system. Starter battery lead and lithium type, total load up to 50 A; main battery bank lead and lithium type, total load up to 300 A / 500 A through the SC303 / SC503 shunt.

Nereide 2 digital switching

A COMPLETE DIGITAL SWITCHING SOLUTION FOR YACHTS — CONTROL PANEL, DC POWER UNIT AND PICO MONITORING IN ONE SYSTEM

CLASSY DESIGN

Nereide 2 control panel



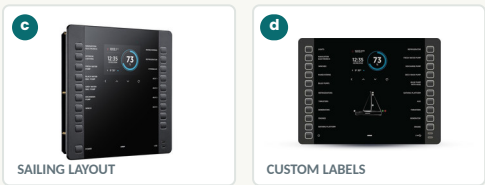
An elegant combination of tactile buttons and a digital display. The aluminium casing and optically bonded display give the control panel a high-end look that complements the interior of the boat or yacht. The slightly raised and rounded buttons provide a comfortable feel when touched, and the front can be flush with the surface or only **5 mm above it**.

Nereide 2 offers everything the PICO monitoring system delivers — battery, tank and temperature monitoring as well as air pressure measurement — built into the same panel.

	No.	The control panel also features	No.	The control panel also features
a	01	Tank and voltage module (8 resistance and 7 voltage inputs)	05	Optional integration of remote battery switch control with feedback and bilge pump control
	02	Error indication with red colour around the respective button	06	Navigational lights display
b	03	Momentary toggle button mode	07	Front mount installation
	04	Compatibility with all SiCom modules	08	Automatic illumination

CUSTOMISATION

Printed labels in your own words and language



Three predefined button configurations are offered, but they are not a limit. Customise the printed labels next to the buttons and combine multiple functions under a single button — in your own words, your own language and your own order.

Panels are laid out at the factory to the vessel's circuit schedule. Send the circuit list with the order.

	Panel property	Nereide 2	Panel property	Nereide 2
c	Switches (left & right side)	18 + 1 (power) = 19	Dimensions with connector	210 × 210 × 40 mm
	Label printing	Custom text, any language, any order	Installation	Front mount, flush or 5 mm proud
d	Output	2 × USB 3.0 (charger), 0,7 A at 5 V	Illumination	Automatic, ambient sensing
	Materials	Aluminium and glass — that is all you see	Fitted by	HanseYachts AG — Hanse, Dehler and Fjord

ULTRA LOW POWER

Remote management and consumption



The distribution unit uses only **10 mA**, while the panel consumes **30 mA** when switched off with the logger active. Nereide 2 can be placed between the main battery and the main switch, so it will not drain the battery over a long lay-up — and even in this low power mode the system still offers comprehensive remote monitoring and management.

	Item	Detail	Value
e	BM-40	Sentinel Marine remote management system — plug and play compatible	Remote monitoring and management
	BM-50	Sentinel Marine remote management system — plug and play compatible	Remote monitoring and management
f	Load wiring	Standard WAGO® connectors on the DC unit	No crimp tooling required
	Panel to power unit	Single SiCAN cable; panel separate from the power unit	Simplifies installation
	Normal operation mode	Panel current draw at 12 V	100 - 200 mA
	Low power, bilge LED active	Panel current draw at 12 V	40 mA
	Low power, bilge LED inactive	Panel current draw at 12 V	30 mA
	NMEA 2000 compatible	Control appliances directly from the plotter over the NMEA protocol	Via SN01 gateway

Nereide panel layouts

THREE PREDEFINED BUTTON CONFIGURATIONS — OR YOUR OWN, IN YOUR OWN WORDS AND LANGUAGE

NEREIDE 2 LAYOUTS

Predefined button configurations



Three predefined button configurations are currently offered, and they are not meant to be a limit — the printed labels beside the buttons are customised to the vessel, and several functions can be combined under a single button.

Eighteen switches sit down the two sides of the panel with a nineteenth power button at the bottom left. The display between them carries the full PICO monitoring system.

	Layout	Typical legend set	Switches
a	Motor yacht	Navigation electronics, interior lighting, fresh water pump, black water mac. pump, grey water mac. pump, deckwash pump, winch, power — manoeuvring, refrigerator, hydraulic, AUX 1 to AUX 4, USB	18 + 1 power
b	Sailing yacht	Lights, navigation electronics, winches, manoeuvring, bilge pumps, refrigerators, thrusters, generators, engines, bathing platform — with the heel and trim display page	18 + 1 power
c	Angled installation view	Aluminium casing, optically bonded display, flush or 5 mm proud of the surface	Front mount
d	Custom	Any wording, any language, any order — send the circuit schedule with the order	18 + 1 power

BUTTON AND EDGE DETAIL

What the panel looks like close up



A blue ring around a button means the circuit is on; a red ring means an error on that channel — blown fuse, stuck relay or missing supply voltage. Buttons are slightly raised and rounded, and the whole panel illuminates automatically to the ambient light level.

	Detail	Means	Applies to
e	Blue ring around the button	Circuit is switched on	Nereide 2 and Nereide Pro
	Red ring around the button	Error on that channel — blown fuse, stuck relay or lack of supply voltage	Nereide 2 and Nereide Pro
f	Panel edge	Front can be flush with the surface or only 5 mm above it	Front mount installation
g	Nereide Pro face	20 physical push buttons milled from aluminium, 200 configurable virtual buttons	270 × 200 × 40 mm

ORDERING A PANEL

What Simarine needs to build the legends



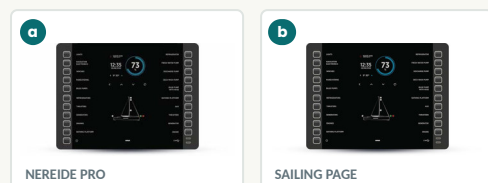
Supply with the order	Detail	Affects
Circuit schedule	One line per switched circuit with its load current and its legend text	Button legends, channel allocation and fuse ratings in the SPU-303
Language	Legends are printed in the language you specify; Nereide Pro stores several sets	Printed labels and the panel menus
Grouped functions	Several outputs combined under one button, e.g. all cabin lighting	Configuration file
Momentary circuits	Circuits that must be momentary rather than latching, e.g. horn, winch	Momentary toggle button mode
Navigation lights	Which lamps are monitored — tricolour, running, aft, port, starboard, anchor	STP-06 module and the navigation lights display page
Remote switches and bilge pumps	Number of remote battery switches and bilge pumps	SRB530 units required

Nereide Pro control panel

A CUTTING-EDGE DIGITAL SWITCHING SOLUTION FOR EVERY YACHT — CUSTOMISABLE IN SECONDS, 80 % LOWER POWER CONSUMPTION

TOUCH & FEEL

Nereide Pro — milled aluminium tactile buttons



Slightly raised and rounded tactile buttons, milled out of aluminium, for everyone who loves the satisfying sound of pressing a button. **Blue light** around the respective button shows that the device is on; **red** indicates an error. The panel features automatic illumination and adapts to surrounding lighting — brighter during the day, darker at night.

Configuration is simple and fast: button labels and outputs, several switches combined under a single button, and multiple languages that can be toggled later.

	Parameter	Value	Parameter	Value
a	Power source voltage range	6 - 35 V DC	Physical push buttons	20
	Temperature range	-20 up to +70 °C (-4 up to 158 °F)	Configurable virtual buttons	200
	Operating, WiFi on, 100 % illumination	400 mA	Dimensions with connector	270 × 200 × 40 mm
b	Operating, WiFi on, 70 % illumination	160 mA	Output	2 × USB 3.0, current output 1 A at 5 V
	Operating, WiFi on, 0 % illumination	25 mA	Radio frequency band	2,4 GHz
	Power off, logger still active	10 mA	Logger capacity (for battery)	Up to 3 years

EXPANDABLE SYSTEM

Nereide Pro connectivity



The Nereide Pro control panel connects to several AC and DC units as well as to all the PICO system's extension modules. An extension module to control remote switches and bilge pumps completes the digital switching system.

Connectivity, up to	Qty	Connectivity, up to	Qty
Batteries	6	Smartphone application	2
Shunts	24	SAC units	10
Temperature sensors	10	SPU 303	10
Tank level sensors	14	SRB18 / SRB30	10
Inclinometer sensors	2	Bus / control	SiCAN + SiCOM

80 % LOWER CONSUMPTION

Power budget of a typical Nereide Pro system



Average consumption of a typical system when turned ON is **300 to 500 mA** (control panel + AC distribution unit + DC distribution unit). Set to power saving or sleep mode it drops to **30 - 40 mA** — and it still provides comprehensive remote monitoring and management functions. Consumption when running and in sleep mode depends on the number of connected units, backlight level and Wi-Fi usage; the values given are for the typical system described.

System state	Typical current	Comprises	Remote functions
Turned ON	300 - 500 mA	Control panel + AC distribution unit + DC distribution unit	Full monitoring and management
Power saving / sleep mode	30 - 40 mA	Same system, backlight and Wi-Fi reduced	Full remote monitoring and management retained
NMEA 2000 compatible	—	Appliance control directly from the plotter	Via SN01 gateway
Remote management	—	Plug and play with Sentinel Marine BM-40 and BM-50	Sentinel remote management system
Multiple language sets	—	Button labels stored in several languages, toggled on the panel	Configured in seconds
Grouped switching	—	Several outputs combined under one button	200 configurable virtual buttons

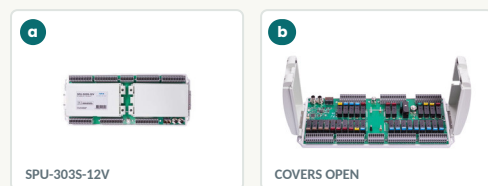
Wiring and installation use standard WAGO® connectors; the DC unit and the control panel are connected over a single SiCAN cable and the control panel is separate from the power unit.

SPU-303 DC distribution unit

31 MANUALLY OVER-RIDEABLE OUTPUT CHANNELS, 200 A TOTAL — COMPATIBLE WITH NEREIDE 2 AND NEREIDE PRO

DC DISTRIBUTION UNIT

SPU-303



The DC unit features **30 outputs rated up to 20 amps** and **1 output rated up to 30 amps**. Altogether the unit is rated for a maximum current of 200 amps. Standard mini-fuses protect the consumers and are easily replaceable. Any error — blown fuse, stuck relay or lack of supply voltage — is indicated on the corresponding button on the control panel.

The unit is sleek, compact and low profile, with an ultra-durable circuit board and protective coating. The robust aluminium base protects the board and provides efficient passive cooling. Protective covers over the relays and fuses open without tools.

	Switching channels	Maximum current	Detail
a	30 × switch channel with standard mini fuse — manual relay override	20 A	Individually fused, manually over-rideable at the unit
	1 × power channel (main switch ON/OFF)	30 A	Master channel
b	All channels combined	200 A	Unit maximum
	SiCAN connectivity	1	Up to 10 SPU-303 units per control panel

SPU-303 SPECIFICATION

Operating data and dimensions



Wiring uses standard **WAGO®** connectors so the unit installs quickly, and multiple units can be used in a single system. The distribution unit draws only **10 mA**, which is what allows the Nereide system to sit permanently between the main battery and the main switch.

Parameter	Value	Parameter	Value
Operating voltage	6 - 35 VDC (12 V DC nominal)	Connectivity	SiCAN, 1 port
Temperature range	-20 °C up to 70 °C (-4 °F to 158 °F)	Dimensions	410 × 169 × 40 mm
Power consumption at 12 V	10 mA	Fuse type	Standard mini blade fuse
Base	Aluminium, passive cooling	Covers	Tool-free protective covers over relays and fuses

ERROR HANDLING

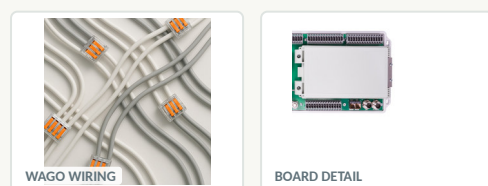
What the panel reports back from the DC unit



Fault	Detected by	Indication on the control panel	Operator action
Blown fuse	Channel feedback in the SPU-303	Red ring around the corresponding button	Replace the mini fuse under the tool-free cover
Stuck relay	Channel feedback in the SPU-303	Red ring around the corresponding button	Use the manual relay override, replace the unit
Lack of supply voltage	Unit supply monitoring	Red ring around the corresponding button	Check the main feed and the main switch

WIRING & INSTALLATION

WAGO® connectors and a single SiCAN run



For quick and easy installation the unit is wired with standard **WAGO®** spring-cage connectors. The DC unit and the control panel are joined by a single SiCAN cable, and because the panel is separate from the power unit the two can be mounted where each fits best.

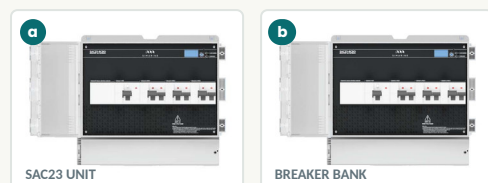
Installation item	Detail	Note
Load terminations	WAGO® spring-cage connectors on all 31 output channels	No crimp tooling required on board
Panel connection	One SiCAN cable, panel to power unit	Up to 10 SPU-303 units per control panel
Position in the circuit	Between the main battery and the main switch	10 mA standby will not flatten the bank
Mounting and service	Low profile aluminium base; tool-free covers over relays and fuses	410 × 169 × 40 mm, mini blade fuses

AC distribution units SAC23

SAC23M-RCBO AND SAC23R-RCBO — TWO SELECTABLE SOURCES, THREE MCB-PROTECTED OUTPUTS AND AN INTEGRATED RCBO

DISTRIBUTE POWER SAFELY

SAC23M-RCBO & SAC23R-RCBO



Distribute AC power safely with one of the two AC power distribution units. The only difference between them is whether the breakers can be disconnected and reconnected **electrically** (SAC23R-RCBO) or **manually** (SAC23M-RCBO).

Each unit has 2 selectable inputs for power sources (shore, inverter or generator) and 3 output channels with overcurrent protection by miniature circuit breakers (MCBs). Both also carry an integrated **RCBO** — residual current circuit breaker with overcurrent protection — which protects in the event of a short circuit or overload and protects the vessel's occupants from electric shock.

SAC23R-RCBO has a motorised RCBO and motorised MCBs, enabling remote switching even after a breaker has tripped. Each channel is monitored for a breaker trip or voltage deficiency; the error is signalled to the panel by changing the button background colour from blue to red.

	Parameter	SAC23R-RCBO-230V	SAC23M-RCBO-230V
a	Supported bus / controlled by	SiCAN / Nereide 2 & Nereide Pro panel	SiCAN / Nereide 2 & Nereide Pro panel
	Power supply voltage	12 V DC	12 V DC
	Normal operating consumption at 12 V DC	15 mA	15 mA
	Idle current consumption from AC source	<50 mA	<50 mA
b	Supported voltage	230 V AC ($\pm 10\%$)	230 V AC ($\pm 10\%$)
	Number of inputs	2 (e.g. shore and inverter)	2 (e.g. shore and inverter)
	Number of output channels / expansion output	3 / 1	3 / 1

SWITCHING & MEASUREMENT

Where the two units differ

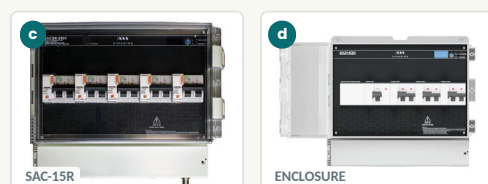


Parameter	SAC23R-RCBO-230V	SAC23M-RCBO-230V	Note
Max. source input current	32 A	32 A	Per selectable input; both units 280 × 340 × 130 mm
Max. output current per channel	16 A	16 A	Per MCB-protected channel
MCB protected outputs / integrated RCBO	Yes / Yes	Yes / Yes	Miniature circuit breakers; shock and overload protection
Remote switching of outputs	Yes	Yes	From the control panel
Remote switching of RCBO / MCB	Yes / Yes	No / No	Motorised RCBO and MCBs on the R version only
Remote switching source / manual override	Yes / Yes	Yes / Yes	Shore, inverter or generator; integrated shunt resistor measures ± 0.1 A input current and ± 0.1 A input voltage

Install to the vessel's applicable AC standard. Test the RCBO at commissioning and at every service interval.

ALSO IN THE RANGE

SAC-15R AC power distribution unit with motorised breakers



The **SAC-15R** AC power distribution unit with motorised circuit breakers is supplied for Nereide 2 and Nereide 3 control panels. It takes 2 selectable 230 V AC inputs and provides 3 output channels plus one expansion output.

	Parameter	SAC-15R	Parameter	SAC-15R
c	Supported bus / controlled by	SiCAN / Nereide 2 & 3 control panel	Max. source input current	32 A
	Power supply voltage	12 V DC	Max. output current per channel	16 A
d	Normal operating current at 12 V DC	15 mA	Remote switching of RCBO / MCB	Yes / Yes
	Supported voltage	230 V AC ($\pm 10\%$)	Dimensions	280 × 340 × 130 mm

SRB530 & STP-06 expansion units

REMOTE BATTERY SWITCHES, BILGE PUMPS AND NAVIGATION LIGHT MONITORING FOR NEREIDE SYSTEMS

REMOTE SWITCH AND BILGE PUMP UNIT

SRB530 – control up to 5 remote battery switches



Control up to **5 remote battery switches** and up to **3 bilge pumps** with the same unit. Several types of remote switch are supported. Switches and pumps are controlled from the Nereide 2 and Nereide Pro control panel, and multiple SRB530 expansion units can be connected to a single control panel.

Each bilge pump channel offers MANUAL, AUTO and GND terminals so the pump keeps its own float-switch operation while the panel provides remote control and status.

	Parameter	SRB530	Parameter	SRB530
a	Remote switches	12 V DC — 5 channels	Maximum current, remote switch	8 A
	Bilge pumps	12 V DC — 3 channels	Maximum current, bilge pump	20 A
	Voltage	12 V DC	Additional connectivity, SiCAN	1
b	Temperature range	-20 °C up to 70 °C (-4 °F to 158 °F)	Additional connectivity, SiCOM	2
	Power consumption at 12 V	10 mA	Dimensions	180 × 81 × 40 mm

NAVIGATION LIGHTS MODULE

STP-06 – six monitored light channels



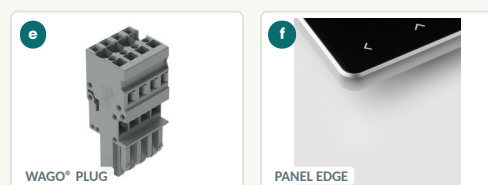
The STP06 is a specialised module for monitoring navigation lights on vessels. It is part of Simarine's modular marine monitoring ecosystem, compatible with the Nereide2 system, and communicates via the SiCOM interface.

Core functions: monitors 6 separate navigation light channels · detects bulb status ON, OFF or FAILURE (blown bulb) · reports errors to the Simarine PICO system · triggers alarms when a fault is detected. Errors and light statuses appear on the PICO screen in a dedicated navigation lights menu, and lights such as the tricolour or the anchor light are monitored individually.

	Parameter	Value	Parameter	Value
c	Voltage range	8 - 35 VDC	Voltage measuring accuracy (U1, U2, U3)	± 0,3 %
	Temperature range	-20 °C - 70 °C (-4 °F - 158 °F)	Voltage resolution / sampling rate	1 mV / 100 ms
	Power consumption at 12 V, operating	5 mA	Resistance inputs R1, R2, R3, R4	0 - 65 kOhm, ± 3 %
d	Independent monitoring channels for lights	6	Dimensions (length × width × height)	141 × 99 × 40 mm
	Monitoring voltage range / max. current per channel	35 VDC / 5 A	Connectivity	SiCOM
	Minimal current detection	10 mA	Monitored circuits	Tricolour, running, aft, port, starboard, anchor

NEREIDE INSTALLATION KIT

Cabling, connectors and sensors for a Nereide system



A Nereide installation needs the panel, one or more SPU-303 DC units, any SAC AC units, the SiCAN cable between them and one SiCOM data cable per expansion module. Temperature sensors and analogue tank senders are ordered to suit the vessel.

	Item	Supplied with / specification	Used for
e	WAGO® spring-cage connectors	Fitted to the SPU-303 and SAC23 output terminals	Load and supply terminations, no crimp tooling
	SiCAN cable	Single cable, panel to power unit	Nereide panel to SPU-303 / SAC23 / SRB530
f	SiCOM data cable	5 m, one supplied with each expansion module	Module daisy-chain and module power
	Temperature sensor NTC10K	1 m lead, JST connector; supplied with SC303 / SC503	Battery compartment and cabin temperature
	Fuse-protected voltmeter cable	3 m, supplied with SC303 / SC503	Battery voltage sensing
	Analogue tank senders	Resistive 0 - 65 kOhm or voltage 0 - 75 V output, third-party	Fresh, grey, black water and fuel tanks

Combo shunts SC303 & SC503

HIGH-AMP SHUNT AND TANK LEVEL MODULE IN ONE — COMPATIBLE WITH PICO, VIA, NEREIDE 2 AND NEREIDE PRO

EXTENSION MODULES

SC303 and SC503 combo shunts



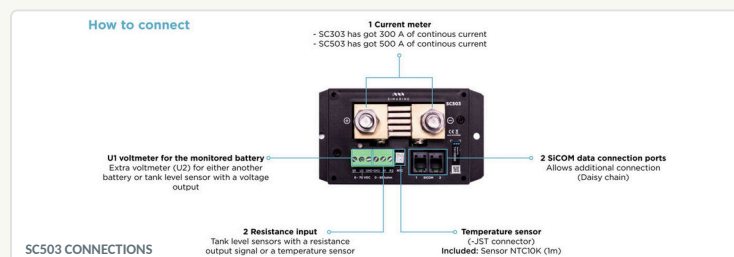
The SC303 and SC503 are an innovative combination of high-amp shunt and tank level module. Their primary purpose is complete battery monitoring — state of charge, current reading, voltage reading and the temperature of the battery compartment.

The additional inputs also monitor extra voltage or resistance sensors such as tank-level senders. The high-amp shunt equally measures the draw of **heavy consumers** (inverters, thrusters, anchor winches) and the current of **generators** (shore chargers, solar). Every shunt is mechanically calibrated.

	Parameter	SC303	SC503
a	Voltage range	6 - 35 VDC	6 - 35 VDC
	Temperature range	-20 °C to 70 °C (-4 °F to 158 °F)	-20 °C to 70 °C (-4 °F to 158 °F)
	Power consumption at 12 V, operating	1.2 mA	1.2 mA
	Current measuring range	0.01 - 300 A	0.01 - 500 A
	Accuracy / resolution / sampling rate	±1 % / 0.01 A / 100 ms	±1 % / 0.01 A / 100 ms
b	Maximal current, continuous	300 A	500 A
	Peak current (<5 min) / (<1 min)	400 A / 700 A	700 A / 1000 A
	Voltage drop at 300 A	37,5 mV	41,6 mV
	Maximal voltage on terminals	35 V	35 V

INPUTS & INSTALLATION

SC303 / SC503 — how to connect



1 current meter — 300 A continuous on the SC303, 500 A on the SC503. **U1 voltmeter** for the monitored battery, with an extra voltmeter (U2) for another battery or a voltage-output tank level sensor. **2 resistance inputs** for resistance-output tank senders or a temperature sensor. **1 temperature sensor socket** (JST connector) with sensor NTC10K (1 m) included. **2 SiCOM data connection ports** allow daisy-chaining.

In the box: 5 m data cable, 1 m temperature sensor, 3 m fuse-protected voltmeter cable, shunt cover and warranty.

Input	Qty	Range	Accuracy	Resolution / rate
Voltage inputs (U1, U2)	2	0 - 75 VDC	± 0.3 %	1 mV / 100 ms
Resistance inputs (R1, R2, JST socket)	3	0 Ohm - 65 kOhm	±3 %	—
Temperature sensor NTC 10K	1	-13 °C to +80 °C	± 3,0 % (from -10 to +60 °C, 14 to 140 °F)	JST connector
Communication / SiCOM ports	2	SiCOM	Daisy chain	5 m cable supplied
Dimensions / battery connection	—	125 × 70 × 22 mm · 4.92 × 2.75 × 0.86 in	M10 bolts	Shunt cover supplied

APPLICATIONS

Choosing between SC303 and SC503



Size the shunt on the largest continuous current the circuit will see, not the peak. Both modules share the same footprint, M10 battery bolts and SiCOM wiring, so a system can be uprated later without changing the cable route. An engine start battery that needs voltage only is read by an ST107 voltage input instead.

	Circuit	Typical continuous current	Recommended module
c	Service battery bank, sail or small motor yacht	Up to 300 A	SC303
	Service battery bank with inverter and thrusters	Up to 500 A	SC503
d	Bow or stern thruster feed, anchor winch	High peak, short duration	SC503 — 1000 A peak for <1 min
	Shore power charger or solar array output	Generator current monitoring	SC303

Quadro shunts SCQ25, SCQ25T, SCQ50

FOUR INDIVIDUAL APPLIANCE CURRENT CHANNELS PER MODULE — CONSUMERS AND GENERATORS METERED SEPARATELY

EXTENSION MODULES

Quadro low-amp shunt modules



A true innovation on the market — quadro low-amp shunt modules for individual appliance monitoring, consumers and generators. With them you can monitor the current flow of **4 individual appliances**. The SCQ25 allows a maximum continuous current of 25 amps per channel and the SCQ50 allows 50 amps per channel.

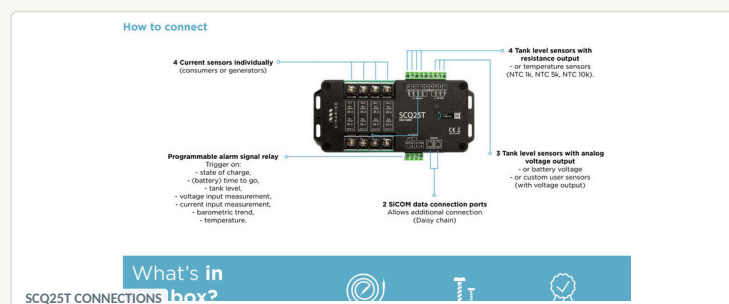
If you need more than 25 amps per channel, wire the appliance in parallel across two channels and configure PICO to monitor those two channels as a single device, doubling the continuous current limit ($2 \times 25 = 50$ A).

The **SCQ25T** is an innovative combination of SCQ25 and the ST107 tank level and voltage module, combining the functionality of both. Connection possibilities: 4 appliances (consumers and/or generators) and 1 alarm signal relay. The alarm signal relay's voltage limit is 60 V and its current limit is 1 A.

	Parameter	SCQ25	SCQ25T	SCQ50
a	Voltage range	6 - 35 VDC	6 - 35 VDC	6 - 35 VDC
	Temperature range	-20 to 70 °C	-20 to 70 °C	-20 to 70 °C
	Power consumption at 12 V	2.5 mA	2.5 mA	2.5 mA
b	Current measuring range per channel	0.01 - 25 A	0.01 - 25 A	0.01 - 50 A
	Accuracy / resolution / sampling rate	1 % / 0.01 A / 100 ms	1 % / 0.01 A / 100 ms	1 % / 0.01 A / 100 ms
	Maximal current, continuous	25 A	25 A	25 A
c	Peak current (<1 min)	35 A	35 A	35 A
	Voltage drop at 300 A	30 mV	—	35 mV
	Current channels / alarm contact	4 / 1	4 / 1	4 / 1
	Dimensions	183 × 91 × 34 mm	183 × 91 × 34 mm · 7.20 × 3.58 × 1.33 in	183 × 91 × 34 mm
	Connectivity	SiCOM	SiCOM	SiCOM

SCQ25T ADDITIONAL INPUTS

Tank level and voltage inputs on the combined module



The SCQ25T adds 3 voltage inputs and 4 resistance inputs to the four current channels, plus the programmable alarm signal relay. In the box: 5 m data cable, screws and warranty.

Input	Qty	Range	Accuracy	Resolution / rate
Voltage inputs (U1, U2, U3)	3	0 - 75 VDC — battery voltage, voltage-output tank senders, custom sensors	± 0.3 %	1 mV / 100 ms
Resistance inputs (R1, R2, R3, R4)	4	0 - 65 kOhm — resistance tank senders or NTC 1k, NTC 5k, NTC 10k	±3 %	—
Current sensors	4	Consumers or generators, individually metered	±1 %	0.01 A / 100 ms
Programmable alarm signal relay	1	Triggers on state of charge, time to go, tank level, voltage, current, barometric trend, temperature	60 V limit	1 A limit
SiCOM data connection ports	2	Allows additional connection (daisy chain)	—	5 m cable supplied

ST107 tank module & SDI01 inclinometer

FOUR RESISTANCE AND THREE VOLTAGE INPUTS PLUS A PROGRAMMABLE ALARM RELAY — AND PITCH AND ROLL TO 0,1°

EXTENSION MODULES

ST107 tank level and voltage module



The ST107 digital tank module is a highly versatile module. Its main purpose is to measure water, fuel or other liquid levels, but it can also measure voltage or temperature. It brings **4 resistance and 3 voltage inputs** to the system.

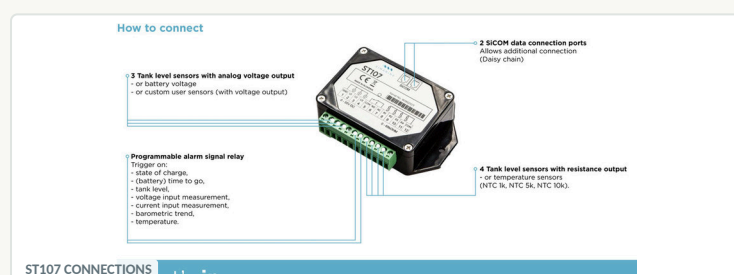
Resistance inputs take analogue resistance-type tank level sensors or temperature sensors; **voltage inputs** take voltage-only batteries (any battery type except lithium), analogue voltage-type tank level sensors and custom user sensors. Resistance inputs require sensors ranging from 0 ohms to 65,000 ohms and voltage inputs sensors from 0 V to 75 V — any tank-level sender that operates in that range will connect.

	Parameter	Value	Parameter	Value
a	Voltage range	6 - 35 VDC	Resistance inputs (R1, R2, R3, R4)	4
	Temperature range	-20 °C to 70 °C (-4 °F to 158 °F)	Resistance range / accuracy	0 Ohm - 65 kOhm / ± 3 %
	Power consumption at 12 V, operating	2.5 mA	Resistance sampling rate	100 ms
b	Voltage inputs (U1, U2, U3)	3	Dimensions	112 × 72 × 31 mm
	Voltage range / accuracy	0 - 75 V / ± 0.3 %	Connectivity	SiCOM, 2 ports, daisy chain
	Voltage resolution / sampling rate	1 mV / 100 ms	Alarm contact	1, programmable, 1 A output

Compatible temperature sensors: NTC 10k (measures down to -13 °C), NTC 5k (down to -20 °C) and NTC 1k (down to -40 °C). In the box: 5 m data cable, screws and warranty.

HOW TO CONNECT

ST107 terminal assignment

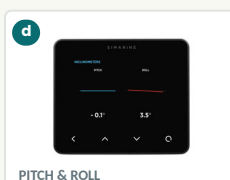


One of the special features of this module is a built-in **programmable alarm signal relay** that can be configured to output a signal of 1 amp if an alarm is triggered.

Terminal group	Connect	Alternative use
3 voltage inputs	Tank level sensors with analogue voltage output	Battery voltage, or custom user sensors with a voltage output
4 resistance inputs	Tank level sensors with resistance output	Temperature sensors NTC 1k, NTC 5k, NTC 10k
Alarm signal relay	Buzzer, lamp or external alarm circuit	Triggers on state of charge, time to go, tank level, voltage, current, barometric trend, temperature
2 SiCOM data ports	Panel or previous module in the chain	Next module in the chain — daisy chain, module powered from the bus

INCLINOMETER

SDI01 high-resolution digital inclinometer



Module SDI01 is a high-resolution digital inclinometer for pitch and roll with manual calibration. It is a plug-and-play device that requires no configuration apart from simple calibration, and it is fully compatible with the PICO, NEREIDE and VIA systems.

	Parameter	SDI01	Parameter	SDI01
c	Voltage range	6 - 35 VDC	Range (pitch & roll)	±89°
d	Resolution	0,1°	Power consumption at 12 V	1 mA
	Calibration	Manual, CAL button on the case	Connectivity	SiCOM

The VIA technical data lists the module as SDI010 — the same part. Up to two inclinometer modules per system. In the box: 5 m data cable, screws and warranty.

SN01 NMEA 2000 gateway & light switches

PUT SIMARINE DATA ON THE VESSEL NETWORK — AND DIM THE CABIN LIGHTING FROM ANODISED ALUMINIUM SWITCHES

EXTENSION MODULES

SN01 NMEA 2000 gateway



The SN01 NMEA 2000 gateway allows the monitoring device (PICO, Nereide) to transmit data to other devices on the NMEA network. PICO sends data about batteries, tanks, temperatures, air pressure and more to other devices, so the chart plotter or MFD displays the same values as the Simarine panel.

	Parameter	SN01	Parameter	SN01
a	Voltage range	6 - 35 VDC	NMEA 2000 backbone	1 drop connection
	Temperature range	-20 °C to 70 °C (-4 °F to 158 °F)	Connectivity	SiCOM
b	Power consumption at 12 V, operating	0,6 mA	Dimensions	111.80 × 77.52 × 32.11 mm · 4.40 × 3.05 × 1.26 in

SUPPORTED PGNS

NMEA 2000 Parameter Group Numbers



PGN	PGN name	Receiving	Transmitting
59904	ISO Request	Yes	No
60928	ISO Address Claim	Yes	Yes
126996	Product Information	No	Yes
127257	Attitude	No	Yes
127502	Switch Bank Control	No	Yes
127505	Fluid Level	No	Yes
127506	DC Detailed Status	No	Yes
127508	Battery Status	No	Yes
130310	Environmental Parameters	No	Yes
130314	Actual Pressure	No	Yes

ACCESSORIES

Light switches with programmable dimmers



Anodised aluminium light switches with programmable dimmers — set the switch location or address so that the same light can be controlled from two or more switches while only one switch needs to be connected.

The light switches are a standalone product, independent of the monitoring system and not connected to it. They provide a **two-channel dimmer** for each individual switch; if a dimmer is off the switch can be used for turning other devices on and off up to 5 A. Two colours are available: black and silver.

	Order code	Colour	Parameter	Value
c	N-LS-D-2B	Black anodised aluminium	Voltage range	0 - 16 V DC
d	N-LS-D-2S	Silver anodised aluminium	Outputs	2
	Maximum load per output	5 A	PWM — pulse width modulation (default)	12 V, 400Hz
	Power consumption, double switch, no load	5 mA to 20 mA	Dimensions (width × height × depth)	60 × 60 × 42 mm
	Dimmer channels per switch	2, programmable	Address / location setting	Programmable — several switches control one light
	Non-dimmed use	Dimmer off — switch turns other devices on / off	Maximum non-dimmed load	5 A

Custom Marine builds the Simarine configuration file before despatch — battery chemistry and capacity, shunt allocation, tank curves with multiple calibration points, sensor naming and alarm thresholds.

PICO display pages

WHAT APPEARS ON THE SCREEN, AND WHICH EXPANSION MODULE PUTS IT THERE

BATTERY PAGES

State of charge, voltage and consumption

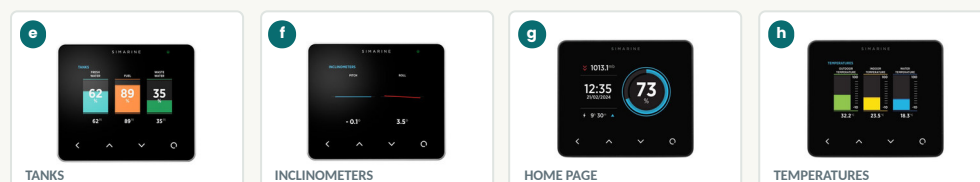


Every value on these pages comes from a shunt. Without one the monitor shows voltage only.

	Page	Fields shown	Module required
a	Two-bank battery view	State of charge and voltage for the starter and the main bank side by side	SC303 or SC503 + ST107
b	Battery with device bars	Main bank SOC with live current for lights, refrigerator, instruments and solar panel	SC303 / SC503 + SCQ25 / SCQ50
c	Consumption detail	Per-appliance amps, incoming solar current, bank voltage and time to go	SCQ25, SCQ25T or SCQ50
d	Main battery summary	State of charge ring, remaining ampere hours, time to charge or discharge, temperature	SC303 or SC503
	Battery banks displayed	Up to 6 banks, each named and shown with its own chemistry and capacity	One shunt per bank

TANKS, TRIM AND WEATHER

Tank levels, inclination and the barograph

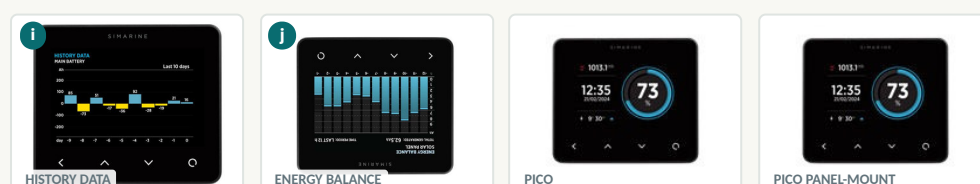


Up to 12 tanks can be shown; irregular tanks take several calibration points so the reading stays true across the whole depth.

	Page	Fields shown	Module required
e	Tanks	Fresh water, fuel and waste water as coloured bars with percentage	ST107 or SCQ25T
f	Inclinometers	Pitch and roll to 0,1°, range ±89°	SDI01
g	Home page	Air pressure in mb, clock and date, state of charge ring, time to go	Built in barograph
h	Temperatures	Outdoor, indoor and water temperature bars, up to 12 sensors	SC303 / SC503 / SCQ25T / ST107
	Barograph	Air pressure in real time with trend arrow and stored history	Built in — no module needed

HISTORY

Three years of battery data on the monitor itself



The logger runs even when the monitor is switched off, drawing 5 mA.

	Stored data	Depth	Viewable
i	Battery and battery bank history	1200 days — more than 3 years	On the monitor and in the Simarine app
j	Energy balance	Total charging and discharging over the selected window	Bar chart on the monitor
	Shunt history — solar, charger, fridge, lighting, appliances	100 days	Up to 20 current channels
	Logger operation	Continues with the panel switched off	5 mA at 12 V
	Remote access	Same data from anywhere through the boat, marina or campsite router	Simarine app over Wi-Fi

Simarine module identification

TELLING THE SICOM MODULES APART ON THE SHELF AND IN THE BILGE — SHUNTS, TANK MODULES AND GATEWAYS

HIGH-AMP SHUNTS

SC303 and SC503 — identical case, different rating



Both shunts share the same 125 × 70 × 22 mm case and the same M10 battery bolts. The silk-screened model designation on the top face is the only visual difference — check it before fitting.

	Marking	Continuous	Peak <5 min	Peak <1 min	Voltage drop at 300 A
a	SC303	300 A	400 A	700 A	37,5 mV
b	SC503	500 A	700 A	1000 A	41,6 mV
c	Terminal end	U1, U2, GND, R1, R2, NTC	0 - 75 VDC	0 - 65 kOhm	2 SiCOM ports
d	Battery connection	M10 bolts	Shunt cover supplied	Mechanically calibrated	125 × 70 × 22 mm

QUADRO SHUNTS

SCQ25, SCQ25T and SCQ50 — how to tell them apart

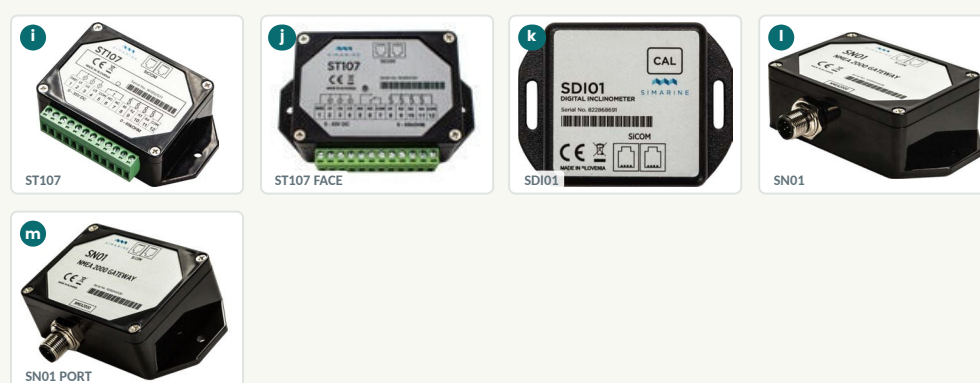


All three modules use the same 183 × 91 × 34 mm case with four current channels along the top. The SCQ25T is the only one with the additional green voltage and resistance terminal block.

	Marking	Per channel	Voltage in	Resistance in	Distinguishing feature
e	SCQ25	0.01 - 25 A	—	—	Four current channels only, one alarm contact
f	SCQ25T	0.01 - 25 A	3	4	Extra green terminal block — SCQ25 plus ST107 in one case
g	SCQ50	0.01 - 50 A	—	—	Heavier busbars, 35 mV drop at 300 A
h	All three	35 A peak <1 min	SiCOM	1 alarm contact	183 × 91 × 34 mm, 2.5 mA at 12 V

TANK, TRIM AND NETWORK MODULES

ST107, SDI01 and SN01



Three modules, three cases. ST107 has the twelve-way green terminal strip; SDI01 is the flat white-labelled square with the CAL button; SN01 carries the M12 Micro-C connector for the NMEA 2000 drop.

	Marking	Identify by	Dimensions	At 12 V
i	ST107	Twelve-way green terminal strip, printed input map on the lid	112 × 72 × 31 mm	2.5 mA
j	ST107 face	Numbered terminals 1 - 12, 0 - 30V DC and 0 - 65kOHM legends	2 SiCOM ports on the top edge	—
k	SDI01	Flat square case, CAL button, serial number label	Pitch and roll ±89°, 0,1°	1 mA
l	SN01	Angled case with M12 Micro-C connector	111.80 × 77.52 × 32.11 mm	0,6 mA
m	SN01 network end	One NMEA 2000 backbone drop, two SiCOM ports	4.40 × 3.05 × 1.26 in	—

Switching hardware identification

DISTRIBUTION UNITS, PANELS, KEYPADS AND LIGHT SWITCHES — WHAT EACH BOX LOOKS LIKE

DISTRIBUTION UNITS

SPU-303, SRB530, SAC23, SPDU-52 and SPDU-66



Five power units on three buses. The SPU-303 and the SAC units answer to a Nereide panel over SiCAN; the SPDU-52 and SPDU-66 answer to a VIA or PICO panel over SiCOM; the SRB530 sits on both.

	Unit	Identify by	Bus	Dimensions
a	SPU-303	Long white case with WAGO® strips down both long edges, 31 channels	SiCAN	410 × 169 × 40 mm
b	SRB530	Black case, five remote-switch groups and three bilge pump groups	SiCAN + SiCOM	180 × 81 × 40 mm
c	SAC23M / SAC23R	Enclosed AC unit with MCB bank and RCBO behind a clear cover	SiCAN	280 × 340 × 130 mm
d	SPDU-52	White case printed CARAVAN PDU 52, orange spring terminals	SiCOM	200 × 160 × 42 mm
e	SPDU-66	White case printed POWER DISTRIBUTION UNIT rev 1.0, digital input block	SiCOM	200 × 160 × 42 mm

PANELS AND KEYPADS

VIA panel and the SK8 keypad

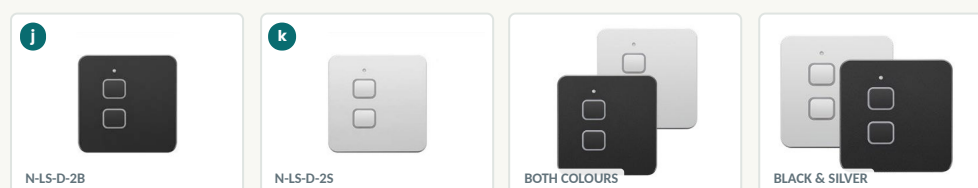


The VIA panel carries the display and seven buttons in one 157 mm bezel; the SK8 is a separate eight-button keypad on the same SiCOM bus.

	Item	Buttons	Connects to	Dimensions
f	VIA control panel	6 control + 1 display	SPDU-52 or SPDU-66 over SiCOM	157.10 × 82.10 × 5.60 mm
g	VIA panel, vehicle page	Same	Shows both battery banks and status icons	6.18 × 3.23 × 0.22 in
h	SK8	8 programmable backlit	PICO, VIA, SPDU-66 or SPDU-52 over SiCOM	82 × 63 × 22.6 mm
i	Panel finish	Anodised aluminium and glass	Automatic illumination	Sleep mode 5 mA

LIGHT SWITCHES

N-LS-D-2B and N-LS-D-2S



Two channels of programmable dimmer per switch, 5 A per output, 60 × 60 × 42 mm.

	Order code	Finish	Outputs	Notes
j	N-LS-D-2B	Black anodised aluminium	2 × 5 A	Two-channel dimmer, PWM 12 V 400Hz
k	N-LS-D-2S	Silver anodised aluminium	2 × 5 A	Two-channel dimmer, PWM 12 V 400Hz
	Address setting	Programmable location / address	—	Two or more switches control the same light; only one is wired to the load
	Standalone	Independent of the monitoring system	0 - 16 V DC	5 mA to 20 mA, double switch, no load
	Non-dimmed use	Dimmer switched off — the switch then simply turns other devices on and off	5 A max	60 × 60 × 42 mm

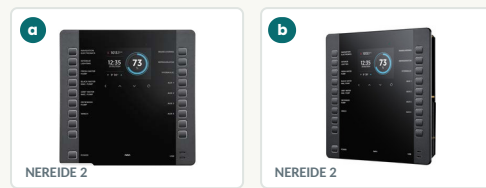
Send the circuit schedule with the enquiry and Custom Marine returns the unit count, the button legends and the SiCAN / SiCOM cable schedule as one quotation.

Simarine technical data

TECHTALK — CONSOLIDATED OPERATING DATA FOR THE NEREIDE 2 PANEL AND THE COMPLETE MODULE RANGE

NEREIDE 2

Control panel operating data



The Nereide 2 control panel is the interface for the whole vessel: 19 physical switches, the PICO monitoring engine, two USB 3.0 charging outlets and Wi-Fi for the app. Consumption is quoted at 12 V for the panel alone; add 10 mA per SPU-303 DC unit and 15 mA per SAC AC unit.

	Parameter	Nereide 2	Parameter	Nereide 2
a	Power source voltage range	6 - 35 VDC	Batteries	6
	Temperature range	-20 °C up to 70 °C (-4 °F up to 158 °F)	Shunts	24
	Normal operation mode at 12 V	100 - 200 mA	Temperature sensors	10
	Low power with bilge LED active	40 mA	Tank level sensors	14
b	Low power with bilge LED inactive	30 mA	Inclinometer sensors	2
	Resolution, current / voltage	±0,1 A (1%) / ±0,1 V (1%)	SPU-303 units	10
	Range, voltage inputs / ohmmeter	0 - 75 VDC / 0 - 65 kOhm	Switches (left & right side)	18 + 1 (power) = 19
	Radio frequency bands	2,4 GHz	Output 2 × USB 3.0 (charger) at 5 V	0,7 A
	Dimensions with connector	210 × 210 × 40 mm	Tank and voltage module built in	8 resistance and 7 voltage inputs

MODULE SELECTION MATRIX

Which module provides which input



Module	Current channels	Voltage inputs	Resistance inputs	Alarm relay	Dimensions
SC303	1 × 300 A	2	2 + JST	—	125 × 70 × 22 mm
SC503	1 × 500 A	2	2 + JST	—	125 × 70 × 22 mm
SCQ25	4 × 25 A	—	—	1	183 × 91 × 34 mm
SCQ25T	4 × 25 A	3	4	1	183 × 91 × 34 mm
SCQ50	4 × 50 A	—	—	1	183 × 91 × 34 mm
ST107	—	3	4	1	112 × 72 × 31 mm
SDI01	—	—	—	—	Pitch and roll ±89°, 0,1°
SN01	—	—	—	—	111.80 × 77.52 × 32.11 mm
SK8	—	—	—	—	82 × 63 × 22,6 mm
STP-06	6 light channels	3	4	—	141 × 99 × 40 mm

POWER UNIT SUMMARY

DC and AC distribution units at a glance



Unit	Type	Channels	Max current	Bus	Dimensions
SPU-303	12 V DC distribution	30 × 20 A + 1 × 30 A	200 A	SICAN	410 × 169 × 40 mm
SPDU-52	12 V distribution + shunts	6 relays / 12 fuses	50 A	SICOM	200 × 160 × 42 mm
SPDU-66	12 V DC distribution + shunts	6 relays + 1 fixed fused	100 A	SICOM	200 × 160 × 42 mm
SRB530	Remote switch and bilge pump	5 switches + 3 pumps	8 A / 20 A	SICAN + SICOM	180 × 81 × 40 mm
SAC23M-RCBO	230 V AC distribution, manual	2 in / 3 out + 1 expansion	32 A in, 16 A out	SICAN	280 × 340 × 130 mm
SAC23R-RCBO	230 V AC distribution, motorised	2 in / 3 out + 1 expansion	32 A in, 16 A out	SICAN	280 × 340 × 130 mm
SAC-15R	230 V AC distribution, motorised	2 in / 3 out + 1 expansion	32 A in, 16 A out	SICAN	280 × 340 × 130 mm

Simarine ordering index

EVERY MODEL DESIGNATION IN THE SIMARINE RANGE WITH ITS RATING AND ITS ROLE IN THE SYSTEM

THE RANGE

Monitors, power units and expansion modules



	Model	Description	Key rating	Bus
a	PICO	Battery, tank, temperature and pressure monitor — 2 colours, 2 mount types	6 - 35 VDC, 3.5" IPS, IP67-rated	SiCOM
	VIA	Monitoring and control panel with digital switching, 6 control + 1 display button	6 - 22 VDC, sleep mode 5 mA	SiCOM
	Nereide 2	Yacht control panel, 18 + 1 switches, PICO monitoring built in	6 - 35 VDC, 210 × 210 × 40 mm	SiCAN
	Nereide Pro	Yacht control panel, 20 physical and 200 virtual buttons	6 - 35 V DC, 270 × 200 × 40 mm	SiCAN
	SK8	Digital keypad, 8 programmable backlit buttons	8 - 35 VDC, 82 × 63 × 22,6 mm	SiCOM
	SPU-303	12 V DC distribution unit, 31 manually over-rideable channels	30 × 20 A + 1 × 30 A, 200 A total	SiCAN
	SPDU-52	12 V distribution unit with service, charger, solar and DC/DC shunts	6 relays / 12 fuses, 50 A combined	SiCOM
	SPDU-66	DC distribution unit, 6 fused relays + 1 fixed, 6 digital inputs	100 A combined, 4 shunts 30 - 50 A	SiCOM
b	SAC23M-RCBO	230 V AC distribution unit, manually reset breakers	32 A in, 16 A per channel	SiCAN
	SAC23R-RCBO	230 V AC distribution unit, motorised RCBO and MCBs	32 A in, 16 A per channel	SiCAN
	SAC-15R	230 V AC distribution unit with motorised circuit breakers	32 A in, 16 A per channel	SiCAN
c	SRB530	Remote switch and bilge pump unit	5 switches at 8 A, 3 pumps at 20 A	SiCAN + SiCOM

EXPANSION MODULES & ACCESSORIES

SiCOM devices



	Model	Description	Key rating	Alarm relay
d	SC303	Combo shunt and tank level module, high-amp	300 A continuous, 700 A peak <1 min	—
e	SC503	Combo shunt and tank level module, high-amp	500 A continuous, 1000 A peak <1 min	—
	SCQ25	Quadro shunt module, 4 appliance channels	25 A per channel, 35 A peak	1
g	SCQ25T	Quadro shunt combined with the ST107 tank and voltage module	25 A per channel, 3 U + 4 R inputs	1
f	SCQ50	Quadro shunt module, 4 appliance channels	50 A per channel, 35 A peak	1
h	ST107	Tank level and voltage module	4 resistance + 3 voltage inputs	1
i	SDI01	High-resolution digital inclinometer, pitch and roll	±89°, 0,1° resolution, 1 mA	—
	SN01	NMEA 2000 gateway	1 backbone drop, 0,6 mA	—
	STP-06	Navigation lights module, 6 monitored channels	35 VDC, 5 A per channel	—
j	N-LS-D-2B	Light switch with programmable dimmer, black	2 outputs, 5 A each, 0 - 16 V DC	—
	N-LS-D-2S	Light switch with programmable dimmer, silver	2 outputs, 5 A each, 0 - 16 V DC	—

PICO sets: PICO ONE SET (PICO + SC303) · PICO STANDARD SET (PICO + SC303 + ST107) · PICO BLUE SET (PICO + SC503 + ST107 + SCQ25).

All Simarine modules share the SiCOM bus, so any system on these pages can be extended later without changing the panel, the power unit or the cable route already installed.

Gobius C tank level sensors

GOBIUS SENSOR TECHNOLOGY, SWEDEN — STEPLESS 0-100 % TANK LEVEL MEASURED FROM OUTSIDE THE TANK

'C' THE EXACT TANK LEVEL

Gobius C — three versions, one sensor

Gobius® C


Gobius C is a micro-radar sensor that measures the exact tank level from the **outside** of the tank — nothing is fitted inside, so nothing fouls, corrodes or blocks. It is bonded to the tank bottom with 3M VHB tape and calibrated over Bluetooth from a phone.

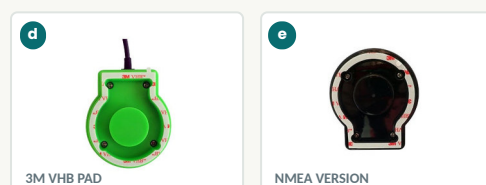
Three versions cover every installation: the **Basic** version drives existing KUS, Wema and other analogue gauges; the **analog outputs** version adds 4-20 mA and 0-5 V outputs; the **NMEA 2000** version puts the tank straight onto the vessel network.

	Art. no.	Version	Outputs	Input voltage	Cable
a	970530	Gobius C, Basic, stepless measurement 0-100 %, version 3.0	0-190 ohm and 240-33 ohm, plus two digital alarm outputs	12-24 V DC, max 29 V	2 m
b	970526	Gobius C, all analog outputs, stepless measurement 0-100 %, version 3.0	4-20 mA (galvanically isolated), 0-190 ohm, 240-33 ohm, 0-5 V, two digital level alarm outputs	9-29 V DC	1 m
c	970534	Gobius C for NMEA 2000, stepless measurement 0-100 %, version 3.0	NMEA2000 fluid level, plus Bluetooth display in the app	9-12 V DC	1 m

Article numbers, outputs and electrical data from gobius.se product pages. Two digital alarm outputs signal tank empty and tank full on the Basic and analog versions.

SENSOR SPECIFICATION

Common to all Gobius C versions

Gobius® C


The sensor carries Bluetooth 5.0, a temperature sensor, an accelerometer and the micro-radar transducer. Measurement resolution is 1 mm with an accuracy of $\pm 2-3$ mm, updated once per second.

	Parameter	Value	Parameter	Value
d	Measuring range	20 - 2,000 mm	Resolution / accuracy	1 mm / $\pm 2-3$ mm
	Tank depth, max / min	2 m / 0.2 m (78" / 7.8")	Measuring interval	1 second
	Current consumption, typical	10 mA	Bluetooth version	5.0
e	Current consumption, maximum	500 mA	Protection rating	IP 56
	Weight / dimensions	65 g / 65 mm high $\times$ 95 mm wide	Tank wall	Plastic, no thickness limit; metal tanks need the adapter
	Tank geometries supported	Rectangular, irregular, vertical circular, horizontal circular	In the box	Sensor, cable, 3M cleaning wipe, quick guide

ACCESSORIES

Adapters, cables and the NMEA 2000 converter

Gobius® C


Metal tanks — steel, stainless and aluminium — need the Gobius C adapter, which fits into standard Wema and KUS sender brackets and seals with two O-rings and 3M adhesive tape.

	Art. no.	Accessory	Detail
f	79060-e	Gobius C adapter for metal tanks	Mounts the sensor on a metal tank, installs into standard Wema & KUS brackets; supplied with 3M adhesive tape and two sealing O-rings
—	79007	Gobius C analog cable, 1 m, 8 pins (male)	Only for Gobius C with analog outputs (art. 970526)
—	970242	NMEA 2000 converter	Converts tank data from Gobius and Gobius Pro to NMEA 2000 networks; 4 channels, 0-190 ohm, 240-33 ohm or self-defined 0-999 ohm inputs; 90 $\times$ 40 $\times$ 25 mm, 115 g, 1 m cable, IP67, 9-16 V, <50 mA, male Micro-C, -40 °C to +85 °C

Gobius Pro tank monitoring

MEASURING FROM THE OUTSIDE OF THE TANK — UP TO NINE SENSORS PER TANK, BLUETOOTH AND APP INCLUDED

GObIUS PRO

Sensor sets — one, two or three sensors

Gobius®



The Gobius Pro sensor measures the level of fluid in virtually any kind of tank — from the outside. Sensors bond to the tank wall and report over Bluetooth to the free app for iPhone and Android. Up to **9 sensors per tank** give as many level steps as the installation needs, and the sets below simply pack one, two or three sensors together.

Sensors work through stainless steel and steel up to 3 mm, aluminium up to 5 mm, polyethylene up to 12 mm and fibreglass up to 8 mm. Supply is 12-24 volts and the circuit should be able to deliver at least 500 mA.

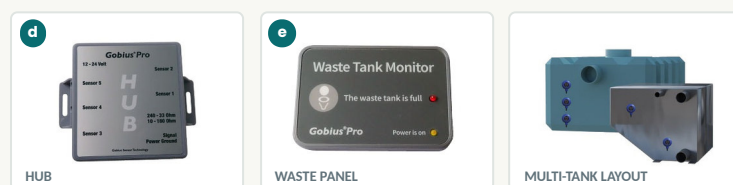
	Art. no.	Set	Contents	Weight
a	970480	Gobius Pro with 1 sensor	1 Gobius Pro sensor, free smartphone app for iPhone and Android	0.6 kg
b	970480-2	Gobius Pro with 2 sensors	2 Gobius Pro sensors, free smartphone app	—
c	970480-3	Gobius Pro with 3 sensors	3 Gobius Pro sensors, free smartphone app	—

Battery is not included. Article numbers and specification from gobius.se product pages.

SYSTEM PARTS

Hub, alarm panel and NMEA 2000 converter

Gobius®



The **hub** gathers up to five sensor inputs and drives a standard analogue gauge; the **Gobius panel (PIR)** is a smart overflow alarm panel with a built-in motion sensor that wakes the system when someone visits the heads and switches off automatically after 60 seconds.

	Art. no.	Part	Specification
d	970435	Hub for Gobius Pro sensors	12-24 volt, sensor inputs 1-5, output signals 10-180 ohm and 240-33 ohm, signal / power / ground terminals
e	970540	Gobius panel (PIR)	Smart overflow alarm panel with built-in motion sensor; 12 volt only, 75 × 52 × 10 mm, 0.5 m cable, 2 LEDs (red and yellow), 6 connectors (3M Scotchlok), 0.2 kg
—	970242	NMEA 2000 converter	Converts tank data from Gobius and Gobius Pro to NMEA2000 networks, up to 4 channels, IP67, 9-16 V, male Micro-C connector

The Gobius panel (PIR) is compatible with Gobius, Gobius Pro and Gobius C, except Gobius C for NMEA 2000.

TANK MATERIALS

Maximum wall thickness by material

Gobius®

Tank material	Max wall thickness	Gobius Pro	Gobius C
Stainless steel	3 mm	Yes	Adapter 79060-e required
Steel	3 mm	Yes	Adapter 79060-e required
Aluminium	5 mm	Yes	Adapter 79060-e required
Fibre glass	8 mm	Yes	Direct bond
Polyethylene / plastic	12 mm	Yes	Direct bond, no thickness limit stated
Sensors per tank	Up to 9 (Gobius Pro)	One level step per sensor	One sensor, stepless 0-100 %
Supply	12 - 24 volts	Circuit must deliver at least 500 mA	9 - 29 V DC depending on version
Fluids	Black water, waste water, grey water, fresh water, diesel, gasoline, AdBlue tanks	Yes	Yes

Gobius sensors mount on the outside of the tank, so a tank that cannot be opened, drained or drilled can still be gauged — the usual answer on a refit where the original sender has failed inside a sealed black-water tank.

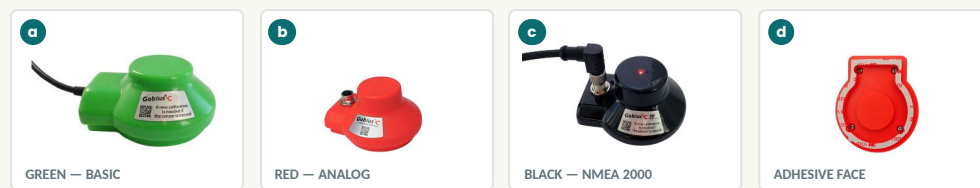
Gobius identification & fitting

SENSOR COLOURS, RETAIL PACKS AND THE METAL-TANK ADAPTER — WHAT ARRIVES AND WHERE IT GOES

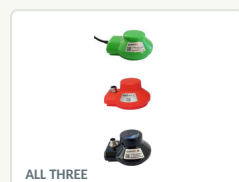
SENSOR COLOUR CODE

Green, red and black — three Gobius C versions

Gobius®



The sensor body is colour coded to the version, so the right unit can be identified on the tank without lifting a sole board: **green** for the Basic version, **red** for the analog-outputs version and **black** for the NMEA 2000 version.



	Art. no.	Version	Colour	Connection
a	970530	Gobius C, Basic	Green	2 m tail, 0-190 ohm and 240-33 ohm outputs to an existing gauge
b	970526	Gobius C, all analog outputs	Red	8-pin connector, cable 79007; 4-20 mA, 0-5 V and both resistance ranges
c	970534	Gobius C for NMEA 2000	Black	NMEA 2000 cable supplied, 1 m
d	Mounting face	3M VHB adhesive ring on the base, bonded to the outside of the tank bottom	All	3M cleaning wipe supplied in the box

RETAIL PACKS

What the boxes look like

Gobius®



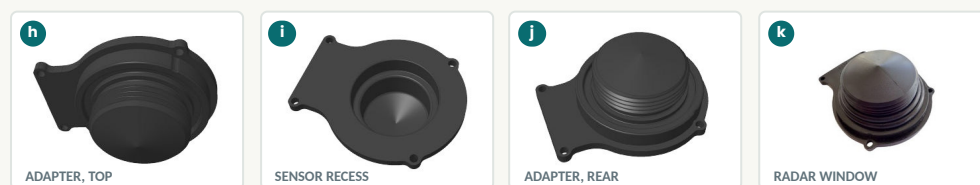
Each carton carries the version banner across the front, so stock can be checked without opening the box: **Basic version for KUS and others (0-190 / 240-33 Ohm), With Analog Outputs, and For NMEA 2000.**

	Pack	Banner text on the carton	In the box
e	970530	Basic version for KUS and others (0-190) (240-33 Ohm)	Sensor, 2 m cable, quick guide, 3M cleaning wipe
f	970526	With Analog Outputs	Sensor, 1 m cable, 3M cleaning wipe
g	970534	For NMEA 2000	Sensor, NMEA 2000 cable, 3M cleaning wipe

METAL TANK ADAPTER

79060-e — fits standard Wema and KUS brackets

Gobius®



On a metal tank the radar cannot see through the wall, so the adapter drops into the existing sender aperture and gives the sensor a plastic window to look through. It installs into standard Wema and KUS sender brackets.

	Art. no.	Item	Detail
h	79060-e	Gobius C adapter for metal tanks	Special adapter for mounting the sensor on a metal tank; installs into standard Wema & KUS brackets
i	—	Sensor recess	The Gobius C sensor sits in the moulded recess and reads through the adapter window
j	—	Underside	Enters the tank through the existing sender aperture
k	—	Radar window	Ribbed plastic window the sensor reads through on a metal tank
—	—	Sealing and bonding	Two sealing O-rings and 3M adhesive tape supplied with the adapter

MPower® digital switching platform

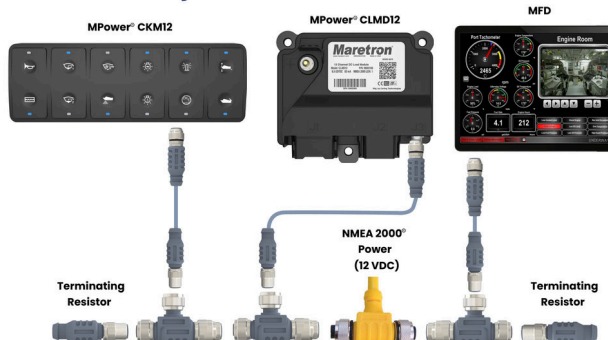
MARETRON MPOWER — SEAMLESS INTEGRATION OF MARETRON PRODUCTS, THIRD-PARTY SENSORS, MFDS AND INSTRUMENTATION

THE MPOWER ADVANTAGE

Basic MPower system connected to an NMEA 2000® network

Maretron
Vessel Monitoring & Control

Basic MPower System Connected to NMEA 2000® Network



BASIC MPOWER SYSTEM — CKM12 KEYPAD, CLMD12 LOAD CONTROLLER, MFD, TEES AND TERMINATORS

All Maretron products are NMEA certified and connect directly to the NMEA 2000 network (the N2K backbone), providing access to and compatibility with an array of Maretron and 3rd-party sensors, multifunction displays and instrumentation. This commitment to standard NMEA PGNs (Parameter Group Numbers) is a compelling advantage of MPower.

Designed to be scalable from small runabout vessels to large yachts, MPower makes it easy to expand or replace existing systems and future-proof the vessel. Used as a whole distributed power control and vessel monitoring system, or applied to resolve a single electrical obstacle, MPower creates superior electrical design versatility and delivers easy, intuitive control over the increasingly complex systems found on today's vessels.

A complete digital switching system with MPower at the centre of control can include	A complete digital switching system with MPower at the centre of control can include
Maretron and 3rd party multifunction displays or web servers that support standard PGN messages	OctoPlex® AC power distribution system
Maretron customisable keypads or digital switch modules	Various wireless key fobs or security input devices
MPower DC load controller modules	Maretron and 3rd party tank level, smoke detection or alarm devices
MPower DC load bypass module	Carling and 3rd party interior, exterior, proximity, limit, float, rain, or water detection switches
Maretron J1939 to NMEA 2000 gateway and more	Any device running Maretron's N2KView® V3 software

SIMPLE. INTUITIVE. EXPANDABLE.

What MPower replaces on board

Maretron
Vessel Monitoring & Control

Application	How MPower does it	Module
Add 'Modes' to the vessel	Any combination of circuits turned on or off with one button — saved presets such as Go Fishing, Anchored, Day Cruise, Night Fishing or Night Cruise	CLMD12 / CLMD16
Add a second helm	Digital switching on a display, Maretron digital keypad or switch bank connected to the vessel's NMEA 2000 bus	CKM12 / VMM6
Eliminate 3rd party controllers	Generator start sequences, windshield wiper control and light dimming configured in the load controller instead of separate boxes cut into the helm	CLMD12 / CLMD16
Generator start sequencing	Three outputs configured as ignition / on, fuel priming and block preheating, and crank signal — one-button remote start	CLMD12 / CLMD16
Windshield wiper controller	Switch the drive and park signals; configure a rain sensor and engine ignition input for automated wipers	CLMD12 / CLMD16
Livewell controller	One switch activates a timed fill, turns on aerator and circulation pump and periodically runs fill and pump-out to replace the water	CLMD16
Trim tab control	Traditional two-wire trim tab actuators connect directly to the polarity reversing (H-Bridge) channels, so trim is controlled from the MFD	CLMD16
Moving parts automation	Proximity or limit switches on the inputs trigger the next sequential event — a single button drives a complex slide-out	CLMD12 / CLMD16
Battery management automation	Voltage sensing inputs trigger remote connection and disconnection of battery banks at user-configurable voltages, with load shedding	CLMD16
Equipment saver	Turn off pumps on tank level data — stop the freshwater pump when the tank is empty, stop the head and send an alert when the waste tank is full	CLMD16 / N2KView®

Monitor and control onboard electrical and electronic systems and reset circuits onboard and remotely with any 3rd party MFD that supports standard digital switching PGNs, the Maretron MBB300C Black Box (Garmin OneHelm, Raymarine LightHouse 3), the Maretron TSM Series dedicated touchscreen, the MPower VMM6 digital switch module, the MPower CKM12 keypad, or any device running Maretron's award-winning N2KView® V3 software.

CLMD12 12-channel DC load controller

MPOWER® CLMD12 — TWELVE DIMMABLE ELECTRONIC CIRCUIT BREAKERS, 75 AMPS TOTAL, NMEA 2000® CONTROLLED

12-CHANNEL DC LOAD CONTROLLER MODULE

CLMD12

Maretron
Vessel Monitoring & Control



Designed for vessels of all sizes with smaller loads, the MPower CLMD12 is a compact 12-Channel DC Load Controller Module. Two of the 12 breakers handle a maximum of 12 amps, six handle a maximum of 10 amps and four handle a maximum of 5 amps, with a total current capacity of **75 amps**. Like circuits can be paralleled.

If a smaller circuit needs to be protected, each of the 12 breakers can be set to trip at lower current levels using Maretron N2KAnalyzer® V3 software. The CLMD12 also has inputs for up to **7 hard-wired switches** that can switch breaker states or serve as inputs for other data such as bilge alarms or hatch positions.

The CLMD12 handles many DC load types such as lights, pumps, motors and electronics, and reports the current through each of the 12 breakers — so over-current faults and under-current conditions can both be reported. For manual control of the loads an MPower 12-Channel Bypass Module (CBMD12) can be installed in conjunction with the CLMD12.

	Part number	Description	Part number	Description
a	CLMD12-R	12-Channel DC Load Controller Module w/A3706 and A3707	A3706	Output (J1) Mating Connector with 0.3m Flying Leads
b	CLMD12	12-Channel DC Load Controller Module	A3707	Input (J2) Mating Connector with 0.3m Flying Leads

DEUTSCH CONNECTOR KIT

CLMD12 mating connectors, sockets, wedges and back shells

Maretron
Vessel Monitoring & Control

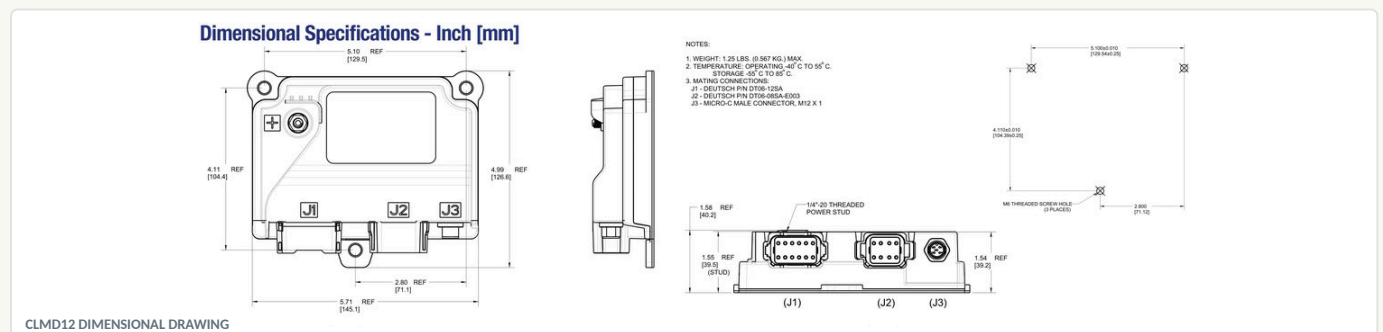
Part number	Description	Part number	Description
DT06-12SA	J1 (Output) Mating Connector, Deutsch	DT06-08SA-E003	J2 (Input) Mating Connector, Deutsch
0462-209-16141	J1 (Output) 14AWG Socket, Deutsch	0462-201-16141	J2 (Input) 16-20AWG Socket, Deutsch
W12S	J1 (Output) Wedge, Deutsch	W8S	J2 (Input) Wedge, Deutsch
1028-043-1205	J1 Back Shell, 12 Way Plug, Deutsch	1011-243-0805	J2 Back Shell, 8 Way Plug, Deutsch

Mating connections: J1 — Deutsch P/N DT06-12SA · J2 — Deutsch P/N DT06-08SA-E003 · J3 — Micro-C male connector, M12 x 1.

DIMENSIONAL SPECIFICATIONS

CLMD12 — inch [mm]

Maretron
Vessel Monitoring & Control



Dimension	Inch [mm]	Dimension	Inch [mm]
Overall width including flanges	5.71 REF [145.1]	Body width	5.10 REF [129.5]
Body height	4.11 REF [104.4]	Overall height including flange	4.99 REF [126.6]
Mounting hole pitch, horizontal	5.100 ±0.010 [129.54 ±0.25]	Mounting hole pitch, vertical	4.110 ±0.010 [104.39 ±0.25]
Lower mounting boss centres	2.800 [71.12]	M6 threaded screw hole	3 places
Depth over connectors (J1) / (J2)	1.55 REF [39.5] stud / 1.58 REF [40.2]	Depth over Micro-C (J3)	1.54 REF [39.2]
Power stud	1/4-20 threaded	Weight (drawing note)	1.25 LBS. (0.567 KG.) max.

Drawing notes: temperature operating -40 °C to 55 °C, storage -55 °C to 85 °C.

CLMD12 specifications

MPOWER® CLMD12 — FEATURES, ELECTRICAL AND MECHANICAL DATA, CERTIFICATIONS AND NMEA 2000® PGNS

PRODUCT FEATURES

CLMD12 electronic circuit breakers and inputs



Twelve dimmable (PWM) Electronic Circuit Breakers give ON/OFF control over the NMEA 2000 network, each with individual current monitoring, a definable power-up state and the option to be locked against inadvertent actuation. Seven discrete inputs are configurable as Active High or Active Low.

Feature	Feature
NMEA 2000® interface	Individual breaker electrical current monitoring
IP67 rated · ignition protected	Breakers can have power-up states defined (ON, OFF, or LAST STATE)
Opto-isolated from NMEA 2000, eliminating potential ground loops	Breakers can be locked against inadvertent actuation
12 dimmable (PWM) ECBs for ON/OFF control over the NMEA 2000 network	7 discrete inputs configurable as Active High, Active Low
2 breakers up to 12 amps · 6 breakers up to 10 amps · 4 breakers up to 5 amps	Automatic ECB overcurrent and thermal shutdown

ELECTRICAL, MECHANICAL & CERTIFICATION

CLMD12 data



Parameter	Value	Comment
Number of channels / switching voltage / max unit current	12 / < 32 VDC / 75 amps	Maximum channel current ratings 4x5A, 6x10A, 2x12A
Voltage input range	6.5 to 32 VDC	DC voltage
Power consumption	150mA @ 12 VDC / 70 mA @ 24 VDC	NMEA 2000 interface
Load Equivalence Number (LEN)	3	NMEA 2000 Spec. (1LEN = 50 mA)
Reverse battery protection / load dump protection	Yes / Yes	Indefinitely; energy rated per SAE J1113
Channel current measurement accuracy / resolution	+/- 0.5 amps / 0.1amps	Typical; minimum channel current measurement 0.5 amps
PWM frequency (all breakers) / load	200 Hz	Inductive load interface not recommended when PWM used
Duty cycle range / resolution	5% - 100% / 1%	Programmable trip level resolution 1 amp
Discrete inputs — resistance / open circuit voltage	1KΩ / 2.75 V	Low 0 to 1.02 V · open 1.51 – 4.31 V · high 4.82 – 32.0 V
Size	5.7" x 5.0" x 1.6" (144.8mm x 127mm x 40.6mm)	Including flanges for mounting
Weight / power stud torque value	1.32 lb. (.599 kg) / 20in-lbs (2.26 N.m)	NMEA 2000 Certified · CE Mark, Recreational Craft Directive 2014/35/EU

NMEA 2000® PARAMETER GROUP NUMBERS

CLMD12 PGNS



PGN#	PGN name	Default rate	PGN#	PGN name	Default rate
65300	Carling Proprietary	1 time / 4 seconds	130921	Carling Proprietary	N/A
127500	Load Controller Connection State & Control	1 / 4 s and on switch change	059392	ISO Acknowledge	N/A
127501	Binary Switch Bank Status	1 / 15 s and on switch change	059904	ISO Request	N/A
127751	DC Voltage / Current	1 time / 15 seconds	060928	ISO Address Claim	N/A
126464	PGN List (Transmit and Receive)	N/A	126208	NMEA Request/Command/Acknowledge	N/A
126996	Product Information	N/A	126993	Heartbeat	1 time / 60 seconds
126998	Configuration Information	N/A	130060	Label	N/A
130818	Maretron Proprietary	N/A	130825	Maretron Proprietary	N/A

PGNs 65300, 127500, 127501 and 127751 are Periodic Data PGNs; 126464, 126996, 126998, 130818, 130825 and 130921 are sent in response to requested PGNs; 059392, 059904, 060928, 126208, 126993 and 130060 are Protocol PGNs.

CBMD12 12-channel bypass module

MANUAL LOCAL CONTROL OF EVERY CLMD12 CIRCUIT — TWELVE CARLING CURVETTE® MARINE ROCKER SWITCHES AND ATC FUSES

12-CHANNEL BYPASS MODULE

CBMD12

Maretron
Vessel Monitoring & Control



Installing the MPower Bypass Module (CBMD12) in conjunction with the MPower 12-Channel DC Load Controller Module (CLMD12) provides owners and operators with the ability to **manually control individual loads locally** with a simple flip of a switch.

The CBMD12 uses standard fuses for overcurrent protection and 12 Carling Curvette® Marine Rocker Switches for manual control of each load. Curvette rocker switches are designed for extreme environments — corrosion, temperature, vibration, shock — and for a minimum of 100,000 actuation cycles. This is a more reliable, safer and simpler process than physically moving a fuse while manually overriding a circuit.

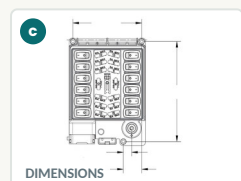
	Part number	Description
a	CBMD12-R	12-Channel Bypass Module w/ Fuse Pack and Jumper Wire
b	CBMD12	12-Channel Bypass Module
	A3720	Bypass Module Jumper Wire with Lugs, 6AWG, Red
	A3721	Bypass Module Fuse Pack (2 qty 15A, 6 qty 10A and 4 qty 5A)

Ensure the current rating of the fuse for each load is appropriate to protect the load and the wiring for that load. The Bypass Module does not support paralleled outputs, since each circuit is controlled by a separate switch, and it does not support dimming of circuits.

PRODUCT FEATURES & DIMENSIONS

CBMD12 outputs and envelope

Maretron
Vessel Monitoring & Control



Maximum current capacity is 75 amps: 12 A max on two outputs, 10 A max on six outputs and 5 A max on four outputs. Suitable for 12 and 24 V DC power systems, with overcurrent protection via ATC standard fuses.

	Feature	Detail	Dimension	Inch [mm]
c	Maximum current capacity	75 amps	Overall width	6.261 REF [159,03]
	Outputs	12A max (two outputs), 10A max (six outputs), 5A max (four outputs)	Overall height	4.318 [109,68]
d	Power systems	12 & 24V DC	Body depth	1.151 REF [29,24]
	Switches	Carling Technologies Curvette® rocker switches	Flange thickness	.517 [13,13]
	Overcurrent protection	ATC standard fuses	Actuation life	Minimum 100,000 cycles

INSTALLATION

CBMD12 pin, switch, circuit and fuse allocation

Maretron
Vessel Monitoring & Control

Deutsch pin #	1	2	3	4	5	6	7	8
Switch #	1	2	3	4	5	6	12	11
Circuit #	5	4	8	2	10	1	11	3
Fuse max rating	10 AMP	12 AMP	10 AMP	10 AMP	10 AMP	10 AMP	10 AMP	5 AMP

Deutsch pin #	9	10	11	12	Dimension	Inch [mm]
Switch #	10	9	8	7	CLMD12 body width	4.786 [121,56]
Circuit #	12	6	9	7	Cover swing radius	6.537 [166,05]
Fuse max rating	5 AMP	5 AMP	5 AMP	12 AMP	Overall assembly length	6.711 [170,45]
Mounting surface to cover, pivot	1.160 [29,46]		1.430 [36,32]		Assembly height	1.730 [43,94]

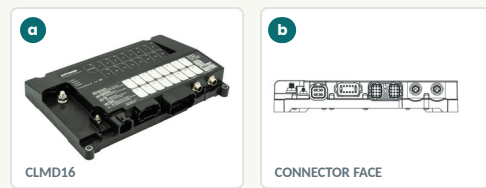
CLMD16 16-channel DC load controller

MPOWER® CLMD16 — SIXTEEN ELECTRONIC CIRCUIT BREAKERS, 125 AMPS TOTAL, TWO H-BRIDGE REVERSING CIRCUITS

16-CHANNEL DC LOAD CONTROLLER MODULE

CLMD16

Maretron
Vessel Monitoring & Control



For larger loads and more circuits, the MPower CLMD16 is a 16-Channel DC Load Controller Module. Four of the 16 breakers handle a maximum of 25 amps and twelve breakers handle a maximum of 12 amps, with a total current capacity of **125 amps**. Circuits can be paralleled.

The CLMD16 also supports **two 12 A H-Bridge reversing polarity circuits** for loads such as engine hatches, passerelles and trim tabs. It has 8 inputs for hard-wired switches that can switch breaker states or serve as inputs for other data such as bilge alarms or hatch positions, plus **2 resistive inputs** and **1 current loop input** for applications including tank level monitoring.

	Part number	Description	Part number	Description
a	CLMD16-R	16-Channel DC Load Controller Module w/A3708, A3709 & A3710	A3709	Output (J1) Mating Connector with 1m Flying Leads
b	CLMD16	16-Channel Load Controller Module	A3710	J3 (I/O Gen Purpose) Harness Kit
	A3708	Output (J2) Mating Connector with 1m Flying Leads	—	—

PRODUCT FEATURES

CLMD16 breakers, inputs and protection

Maretron
Vessel Monitoring & Control

Feature	Feature
NMEA 2000® interface · IP67 rated · ignition protected	Select breakers can be paralleled for larger loads
Opto-isolated from NMEA 2000, eliminating potential ground loops	2 sets of 12 amp breakers can be combined for reversing motor control
16 ECBs for ON/OFF control over the NMEA 2000 network, 12 of them dimmable	Individual breaker current monitoring; power-up states definable (ON, OFF, LAST STATE)
12 breakers carry 12 amps maximum, 4 breakers carry up to 25 amps	Breakers can be locked against inadvertent actuation
Capacitive touch switches for local control of all loads	All inputs and outputs protected against short to power and short to ground
Automatic ECB overcurrent shutdown	Automatic ECB thermal shutdown (overtemperature protection)

DEUTSCH CONNECTOR KIT

CLMD16 mating connectors, sockets, wedges and seals

Maretron
Vessel Monitoring & Control

Part number	Description	Part number	Description
DTP06-4S	J1 (Output) Mating Connector, Deutsch	W12S	J2 (Output) Wedge, Deutsch
0462-203-12141	J1 (Output) 14AWG Socket, Deutsch	1028-043-1205	J2 Back Shell, 12 Way Plug, Deutsch
WP-4S	J1 (Output) Wedge, Deutsch	DRC26-24SA	J3 (I/O General Purpose) Mating Connector, Deutsch
DT06-12SA	J2 (Output) Mating Connector, Deutsch	0462-201-20141	J3 (I/O General Purpose) 16-20AWG Socket, Deutsch
0462-209-16141	J2 (Output) 14AWG Socket, Deutsch	0413-204-2005	J3 Connector Seal Plug, 20 HD SER, Deutsch

H-BRIDGE & GENERAL PURPOSE I/O

What the extra CLMD16 channels do

Maretron
Vessel Monitoring & Control



Two sets of 12 amp breakers can be combined for reversing motor control, so two-wire actuators run directly from the module. Capacitive touch switches on the case give local control of every load without a separate bypass module.

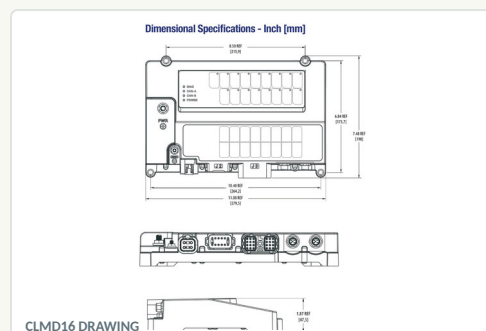
	Channel group	Rating	Typical use
c	12 × dimmable ECB	12 A each	Cabin and deck lighting, pumps, electronics
	4 × ECB	25 A each	Windlass control, heavy pumps, large motor loads
d	2 × H-Bridge reversing polarity circuits	12 A each	Engine hatches, passerelles, trim tab actuators
	8 × discrete switch inputs	—	Hard-wired switches, bilge alarms, hatch positions
	2 × resistive input + 1 current loop input	—	Tank level monitoring and similar analogue sensing

CLMD16 specifications

MPOWER® CLMD16 — ELECTRICAL AND MECHANICAL DATA, CERTIFICATIONS, DIMENSIONS AND NMEA 2000® PGNS

DIMENSIONAL SPECIFICATIONS

CLMD16 — inch [mm]



The CLMD16 measures 11.0" x 7.48" x 1.871" (279.4 mm x 190.0 mm x 47.5 mm) including flanges for mounting and weighs 2.5 lb. (1.2 kg). Power stud torque value is 30 to 35 in-lbs. (3.39 N·m - 3.95 N·m); ground stud torque value is 10 to 15 in-lbs. (1.13 - 1.69 N·m).

Certifications: NMEA 2000 certified · CE Mark, Recreational Craft Directive 2014/35/EU · Lloyd's Certification pending.

Dimension	Inch [mm]	Parameter	Value
Body width	8.50 REF [215,9]	Number of channels	16
Body height	6.84 REF [173,7]	Switching voltage	< 32 VDC
Overall height including flanges	7.48 REF [190]	Maximum unit current capacity	125 amps
Mounting flange pitch	10.40 REF [264,2]	Maximum channel current ratings	12x12A, 4x25A
Overall width	11.00 REF [279,5]	Body depth	1.87 REF [47,5]

ELECTRICAL

CLMD16 electrical specification



Parameter	Value	Comment
Voltage input range	8 to 32 VDC	DC voltage
Power consumption / Load Equivalence Number (LEN)	50mA / 1	NMEA 2000 interface · NMEA 2000 Spec. (1LEN = 50 mA)
Reverse battery protection	Yes	5 minutes
Load dump protection	Yes	12V: 87V, 200ms pulse, 1Ω impedance · 24V: 173V, 100ms pulse, 2Ω impedance
12A / 25A ECB peak current capacity	120 A / 250 A	Analog/digital input channels — input resistance 1KΩ, open circuit 2.75 V
Channel current measurement accuracy / resolution	+/- 0.5 amps / 0.1 amps	Typical; minimum channel current measurement 0.5 amps
PWM frequency	200 Hz / 20 kHz	200 Hz on breakers 3, 4, 5, 6, 7, 8, 9, 10 · 20 kHz on breakers 1, 2, 11, 12
Load / duty cycle range / resolution	Inductive load interface · 10% - 100% / 1%	—
Programmable trip level resolution	1% increments	Between 20% and 100% of channel capacity (12A or 25A)
Alarm output, maximum supplied current	300mA	—
Resistive input measurement accuracy / precision / resolution	5 Ω / 2 Ω / 1 Ω	2 resistive inputs and 1 current loop input

NMEA 2000® PARAMETER GROUP NUMBERS

CLMD16 PGNS



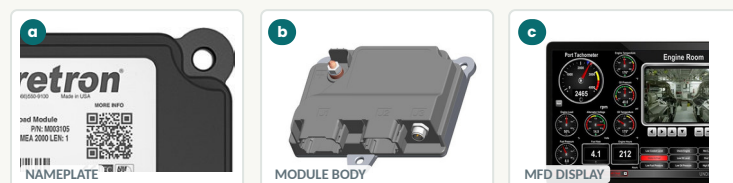
PGN#	PGN name	Default rate	PGN#	PGN name	Default rate
127500	Load Controller Connection State & Control	1 / 1.5 s and on switch change	130818	Maretron Proprietary	N/A
127501	Binary Status Report	1 / 15 s and on switch change	130825	Maretron Proprietary	N/A
127751	DC Voltage / Current	1 time / 1.5 seconds	059392	ISO Acknowledge	N/A
126464	PGN List (Transmit and Receive)	N/A	059904	ISO Request	N/A
126720	Carling Proprietary	N/A	060928	ISO Address Claim	N/A
126996	Product Information	N/A	126208	NMEA Request/Command/Acknowledge	N/A
126998	Configuration Information	N/A	126993	Heartbeat	1 time / 60 seconds
—	—	—	130060	Label	N/A

MPower® installation reference

MODULE LABELS, CONNECTOR PIN NUMBERING AND THE DIMENSIONED DRAWINGS FOR PANEL AND BULKHEAD WORK

MODULE LABEL

Reading the CLMD12 nameplate



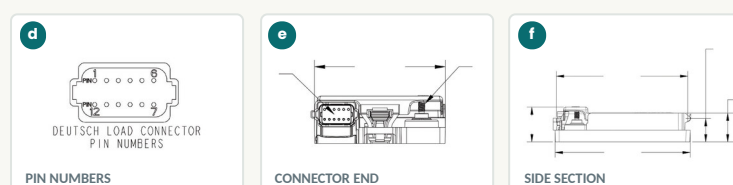
The nameplate on the CLMD12 carries the model, the Maretron part number, the supply range, the NMEA 2000 Load Equivalence Number and the serial number — everything the network designer needs when the module is already installed.

	Label field	Reads	Used for
a	Model / part number	CLMD12 — P/N M003105	Identifies the module and its channel map
	Supply range	6.5-32VDC printed on the label; published voltage input range 6.5 to 32 VDC	Confirms the module suits a 12 V or 24 V system
b	Current and LEN	Label prints 50 mA and NMEA 2000 LEN: 1; the published specification gives 150mA @ 12 VDC / 70 mA @ 24 VDC and LEN 3	Use the published figures for the network power budget
c	Serial number and QR code	S/N and a QR link to the product page	Warranty, firmware and configuration records

Manufactured by Carling Technologies, made in USA.

CONNECTOR PIN NUMBERING

Deutsch load connector and the bypass installation

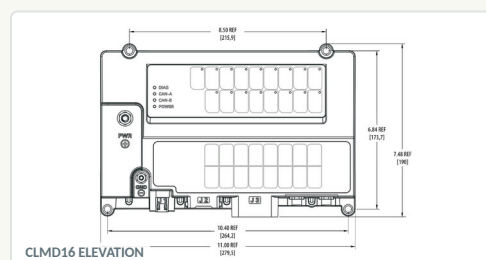


Pin 1 is at the top left of the Deutsch load connector looking into the module, with pin 12 diagonally opposite. Use the pin, switch, circuit and fuse table on the CBMD12 page when the bypass module is fitted — switch order and circuit order are not the same.

	Drawing	Shows	Key dimension
d	Deutsch load connector pin numbers	Pin 1 to pin 12 layout on the J1 output connector	DT06-12SA mating half
e	Connector end elevation	Deutsch load connector and the 1/4-20 threaded power stud	4.786 [121,56]
f	Side section with cover open	Cover swing radius and the mounting-surface-to-cover pivot height	6.537 [166,05] · 1.160 [29,46]

CLMD16 GENERAL ARRANGEMENT

Front elevation with breaker map



The CLMD16 front elevation shows the capacitive touch switch positions above each breaker channel and the DIAG, CAN-A, CAN-B and POWER indicator LEDs at the top left, with the power stud on the left-hand edge.

Allow the full 11.00 REF [279,5] width plus cable entry when planning the bulkhead space, and 1.87 REF [47,5] of depth over the case.

Feature on the drawing	Dimension	Feature on the drawing	Dimension
Body width	8.50 REF [215,9]	Overall width across flanges	11.00 REF [279,5]
Body height	6.84 REF [173,7]	Overall height across flanges	7.48 REF [190]
Mounting flange pitch	10.40 REF [264,2]	Case depth	1.87 REF [47,5]
Indicator LEDs	DIAG, CAN-A, CAN-B, POWER	Local control	Capacitive touch switch per channel
Power stud torque	30 to 35 in-lbs. (3.39N.m - 3.95N.m)	Ground stud torque	10 to 15 in-lbs. (1.13 - 1.69N.m)
Weight	2.5 lb. (1.2 kg)	Mating connectors	DTP06-4S (J1), DT06-12SA (J2), DRC26-24SA (J3)

VMM6 Contura® digital switch module

MPOWER® VMM SERIES — SIX CARLING V-SERIES CONTURA® ROCKERS, IP68 SEALED, NMEA 2000® CAN PROTOCOL

VMM SERIES

Contura® digital switch module, 6 rocker

Maretron
Vessel Monitoring & Control



The VMM6 is a sealed, multiplexed digital switch module featuring the Carling V-Series Contura® rocker switches. Well known for their cutting-edge design, high quality, maximum performance and unmatched reliability, the VMM6 Series reduces the complexity and cost of traditional wiring harnesses, increases product life and reliability and reduces installation time.

Available in six simple configurations, VMM6 is a plug-and-play solution. For customers who want the option to source aftermarket actuators, two versions are offered without actuators (part numbers A3801-5 and A3801-6).

	Part number	Description	Part number	Description
a	A3801-1	Contura II (ALL Position Momentary ON) w/A3702	A3801-4	Contura V (Right Switch 3-Position) w/A3702
	A3801-2	Contura II (Right Switch 3-Position) w/A3702	A3801-5	No Actuators (ALL Positions Momentary ON) w/A3702
b	A3801-3	Contura V (All Positions Momentary ON) w/A3702	A3801-6	No Actuators (Right Switch 3-Position) w/A3702

ADAPTER CABLES

VMM to NMEA 2000® adapter cables

Maretron
Vessel Monitoring & Control



Built-in receptacles couple with Deutsch DT Series 4 and 6 position plugs. The 6-pin connector mates to the VMM to NMEA 2000 adapter cable; the 4-pin receptacle is reserved for future use and the included mating plug must be installed to meet the IP68 rating for the back panel.

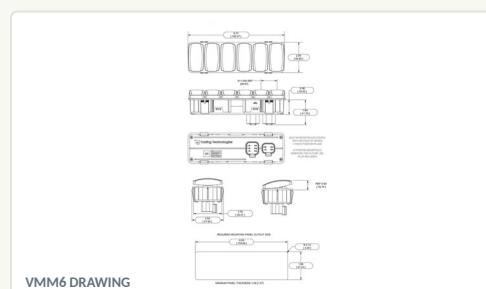
	Part number	Description	Part number	Description
c	A3702	VMM to NMEA 2000® Adapter Cable - .2m	A3702-2	VMM to NMEA 2000® Adapter Cable - .2m (90° Deutsch Connector)
d	A3702-1	VMM to NMEA 2000® Adapter Cable - 1m	A3702-3	VMM to NMEA 2000® Adapter Cable - 1m (90° Deutsch Connector)

A3702 is 7.87 in [.2m] long. Plug included.

FEATURES & DIMENSIONS

VMM6 — inch [mm]

Maretron
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Built-in receptacles couple with Deutsch DT Series 4 and 6 position plugs; the 4 position receptacle is reserved for future use and its plug is included. The required mounting panel cut-out and the minimum panel thickness are given in the table below.

Product feature	Product feature	Dimension	Inch [mm]
NMEA 2000® CAN protocol	LED feedback of circuit state	Overall length	6.31 [160.27]
IP68 front panel sealing protection (when connected)	Low current switching	Overall height	2.04 [51.92]
Configurable	Tactile and audible feedback	Rocker pitch, 5 spaces	5 × 1.050 REF [26.67]
Horizontal or vertical mounting options	Snap-in mounting for fast, easy assembly	Panel cut-out, length	6.09 [154.69]
Aftermarket actuators available	Fully sealed IP68 back panel when connected and mating plug installed	Panel cut-out, height	1.86 [47.24]
Customisable icons — standard selection or custom, consult the factory	Variety of Carling V-Series Contura® actuators	Cut-out corner radius	R 0.12 [3.05]
Bezel depth / body depth	0.96 [24.52] / 1.64 [41.79]	Minimum panel thickness	0.06 [1.57]
Rocker face height	2.00 [50.80]	Reference depth behind bezel	REF 0.64 [16.70]

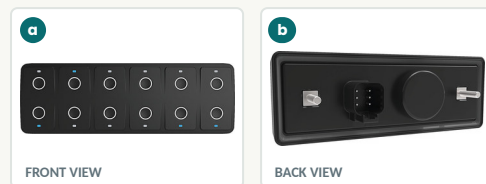
Unit label carries the model designation, date code and serial number — the dimensional drawing shows the example VMM-00000009 on the label. Panel cut-out sizes above are the required mounting cut-out.

CKM12 12-button customisable keypad

MPOWER® CKM SERIES — LASER-ETCHED LEGENDS, LED FUNCTION LIGHTS, IP69K FRONT PANEL SEALING

CKM SERIES

12-button customisable keypad

Maretron
Vessel Monitoring & Control

The CKM12 is a customisable keypad featuring laser-etched legends and LED function lights for each button. The LEDs also provide diagnostics when fault conditions are detected.

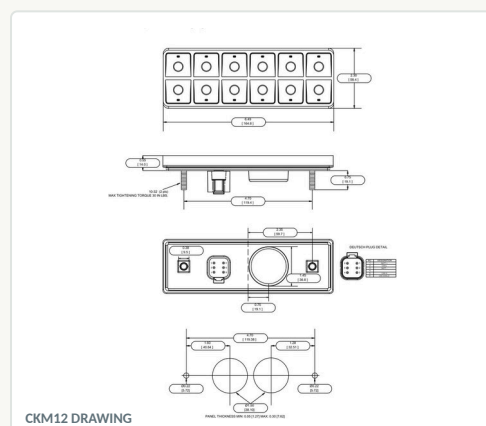
With rugged mechanical packaging (IP69K) the CKM12 can be installed inside or outside the cabin. The low-profile design offers a seamless dashboard look and it can be mounted either vertically or horizontally. It offers significant advantages over traditional electromechanical switches — longer actuation cycle (1,000,000), reduced wiring harness and reduced installation time. The CKM12 is sold off the shelf in two configurations and includes a CKM to NMEA 2000® adapter cable.

	Part number	Description	Part number	Description
a	A3802-1	CKM12 Keypad (Circle on Buttons) w/A3703	A3703-1	CKM to NMEA2000® Adapter Cable - 1m
b	A3802-2	CKM12 Keypad (Number in Center of Circle on Buttons) w/A3703	A3703-2	CKM to NMEA2000® Adapter Cable - .2m (90° Deutsch Connector)
	A3703	CKM to NMEA 2000® Adapter Cable - .2m	A3703-3	CKM to NMEA2000® Adapter Cable - 1m (90° Deutsch Connector)

A3703 is 7.87 in [.2m] long. Standard blue LED function lights — consult the factory for additional options. Choose from the standard selection of icons or customise; consult the factory for options and minimum quantities.

FEATURES & DIMENSIONS

CKM12 — inch [mm]

Maretron
Vessel Monitoring & Control

NMEA 2000® CAN protocol · IP69K front panel sealing protection · configurable · diagnostic feedback · standard or custom laser-etched legends · 1,000,000+ button actuation cycles · low current switching · tactile and audible feedback.

Sealing: IP69K on the front panel, fully sealed IP68 back panel when connected. Two 10-32 mounting studs, maximum tightening torque 30 inch lbs.

Dimension	Inch [mm]	Dimension	Inch [mm]
Overall length	6.49 [164.8]	Panel cut-out length	4.70 [119.38]
Overall height	2.30 [58.4]	Panel cut-out height	1.60 [40.64]
Body thickness (low profile design)	0.55 [14.0] — .57 inch [14.48 mm] quoted	Cut-out inner dimension	1.28 [32.51]
Mounting stud pitch	4.70 [119.4]	Mounting hole diameter	Ø0.22 [5.72]
Connector boss diameter	Ø1.50 [38.10]	Panel thickness min / max	0.05 [1.27] / 0.30 [7.62]
Button block height / width	2.35 [59.7] / 1.45 [36.8]	Button pitch	0.75 [19.1] · 0.38 [9.5]
Mounting studs	10-32, 2 places	Maximum tightening torque	30 in lbs.
Button actuation cycles	1,000,000+	Mounting orientation	Vertical or horizontal

DEUTSCH PLUG DETAIL

CKM12 connector pin-out

Maretron
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Pin no.	1	2	3	4	5	6
Designation	BATT +	CAN L	BATT -	CAN H	CAN SHIELD	—

Mates to the CKM to NMEA 2000® adapter cable. Maximum tightening torque on the two 10-32 mounting studs is 30 inch lbs.

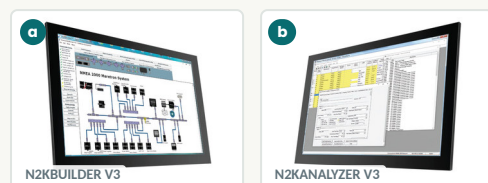
MPower® configuration tools & gateways

N2KBUILDER® V3, N2KANALYZER® V3, USB100 AND IPG100 — DESIGN, CONFIGURE AND CONNECT THE NETWORK

BUILD. ANALYZE. INTEGRATE.

MPower® configuration tools

Maretron
Vessel Monitoring & Control



N2KBUILDER® V3 is a powerful, free PC-based software used to plan, document and validate the design of complex NMEA 2000 networks. It produces a Bill of Materials for Maretron products directly, eliminating guesswork and transcription errors. An MPower tab contains the builder information for the CLMD12, CLMD16, CBMD12, VMM6 and CKM12, and configuration created during planning can be exported directly to N2KAnalyzer V3.

N2KAnalyzer® V3 is offered free with a Maretron NMEA 2000/USB gateway (USB100) or NMEA 2000/Ethernet gateway (IPG100). It gives a detailed view of every device on the network and performs configuration, updating and troubleshooting — configure the CLMD12 and CLMD16 with it and save the result with the Save File function.

	Software	Function	Reference
a	N2KBUILDER® V3	NMEA 2000® network design software — plan, document, validate, produce a BOM	maretron.com · products/N2KBUILDER.php
b	N2KANALYZER® V3	NMEA 2000® network analysis software — configure, update, troubleshoot, set breaker trip levels	maretron.com · products/N2KANALYZER.php
	N2KVIEW® V3	Onboard and remote vessel monitoring and control software	Runs on PC, Mac, tablet or smartphone

GATEWAYS

USB100 and IPG100 — your gateway to the NMEA 2000® network

Maretron
Vessel Monitoring & Control



The **USB100** bridges computers to an NMEA 2000 network for PC-based monitoring software such as N2KVIEW® V3. Paired with N2KAnalyzer it is also the source for updating most Maretron equipment, and it automatically converts NMEA 2000 data to NMEA 0183 sentences for navigation software that needs them.

The **IPG100** connects a PC, Mac, tablet or smartphone to an NMEA 2000 network over Ethernet, and once enabled connects automatically to Maretron's Real Time Cloud Service (subscription required) for remote access to the vessel.

	Part number	Description	Connects
c	USB100-01	USB100 NMEA 2000® network to USB gateway	PC to the NMEA 2000 backbone; converts to NMEA 0183 sentences
d	IPG100-01	IPG100 NMEA 2000® Internet Protocol gateway	Ethernet data port to routers, switches and wireless modems

MPower® ORDERING SUMMARY

Every MPower part number in one table

Maretron
Vessel Monitoring & Control

Part number	Description	Part number	Description
CLMD12-R	12-Channel DC Load Controller Module w/A3706 and A3707	A3720	Bypass Module Jumper Wire with Lugs, 6AWG, Red
CLMD12	12-Channel DC Load Controller Module	A3721	Bypass Module Fuse Pack (2 qty 15A, 6 qty 10A and 4 qty 5A)
CLMD16-R	16-Channel DC Load Controller Module w/A3708, A3709 & A3710	A3801-1	VMM6 Contura II (ALL Position Momentary ON) w/A3702
CLMD16	16-Channel Load Controller Module	A3801-2	VMM6 Contura II (Right Switch 3-Position) w/A3702
CBMD12-R	12-Channel Bypass Module w/ Fuse Pack and Jumper Wire	A3801-3	VMM6 Contura V (All Positions Momentary ON) w/A3702
CBMD12	12-Channel Bypass Module	A3801-4	VMM6 Contura V (Right Switch 3-Position) w/A3702
A3706	CLMD12 Output (J1) Mating Connector with 0.3m Flying Leads	A3801-5	VMM6 No Actuators (ALL Positions Momentary ON) w/A3702
A3707	CLMD12 Input (J2) Mating Connector with 0.3m Flying Leads	A3801-6	VMM6 No Actuators (Right Switch 3-Position) w/A3702
A3708	CLMD16 Output (J2) Mating Connector with 1m Flying Leads	A3802-1	CKM12 Keypad (Circle on Buttons) w/A3703
A3709	CLMD16 Output (J1) Mating Connector with 1m Flying Leads	A3802-2	CKM12 Keypad (Number in Center of Circle on Buttons) w/A3703
A3710	CLMD16 J3 (I/O Gen Purpose) Harness Kit	A3702 / A3703	VMM / CKM to NMEA 2000® Adapter Cable - .2m

Custom Marine designs the NMEA 2000 backbone in N2KBUILDER® V3 before any hardware ships — drop lengths, tee count, terminator positions, LEN budget and the full bill of materials — then delivers the MPower configuration file with the modules.

OctoPlex® G2-Series

MARETRON OCTOPLEX — NMEA 2000® CERTIFIED AC AND DC POWER DISTRIBUTION SYSTEM FOR THE WHOLE VESSEL

INTELLIGENCE FOR GREATER PERFORMANCE

The G2-Series system

Maretron
Vessel Monitoring & Control



The Maretron OctoPlex® system puts the user in complete control of all AC and DC loads within the vessel. By using an NMEA2000® CAN bus network, a **redundant architecture** ensures system reliability and safety, removing single point failures.

OctoPlex offers significant weight reduction in wiring and reduced installation complexity, while also allowing the monitoring and control of common NMEA2000 marine devices such as compass, GPS and tank level adapters. The NMEA2000 network allows remote control of **field-replaceable AC and DC circuit breakers**, enabling the placement of panels in remote locations and removing the need for traditional large electrical panels.

Ref.	Component	Function
1	Battery Monitor	Measures and reports 12 and/or 24 VDC, single high-side current and up to four battery temperatures; configurable alarm thresholds for voltage, current and temperature displayed via the MFD
2	AC Power Distribution Unit, 8, 13 and 19 position	AC circuit protection, remote ON/OFF actuation and status monitoring (single, double or three-pole breakers)
3	AC Power Monitor	Measures and reports the status of up to four AC lines including voltage, current and frequency; 110 V, 220 V, three phase and 240 V European applications
4	System Interface Unit Monitor (SIU)	Monitors and reports the status of up to 34 discrete inputs; also suitable for bilge float switches, hatch door open/closed, dimming and similar
5	Network Power Supply	Provides regulated power to the dual NMEA2000 network
6	DC Power Distribution Unit, 8 and 16 position	DC circuit protection and remote control for up to sixteen DC circuits; each circuit has a fully configurable trip profile
7	Multi-Function Display	A configurable 8 or 12.1-inch dedicated Multi-Function Display (MFD) provides an extremely simple interface for system control and monitoring
8	DC Power Distribution Unit, 8 position	DC circuit protection and remote control for up to eight DC circuits; each circuit has a fully configurable trip profile

SYSTEM COMPONENTS

Identify each unit

Maretron
Vessel Monitoring & Control



WHY A REDUNDANT BUS

Dual CAN architecture and what it removes from the vessel

Maretron
Vessel Monitoring & Control

Traditional AC/DC panel	OctoPlex® G2-Series	Benefit on board
One large panel at the helm, every load cabled back to it	Distribution units placed next to the loads, joined by a CAN bus	Significant weight reduction in wiring and reduced installation complexity
Single wiring path — one fault takes out the panel	Redundant dual CAN bus architecture	System reliability and safety; single point failures removed
Breakers reset by hand at the panel	Remote control of field-replaceable AC and DC circuit breakers	Panels can sit in remote locations; no large electrical panel needed
Separate instruments for tanks, compass and GPS	Monitoring and control of common NMEA2000 marine devices	One display shows switching and vessel data together

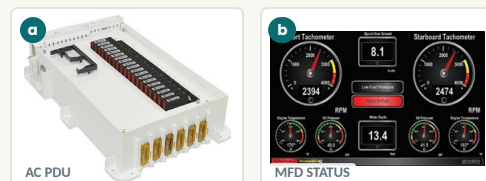
OctoPlex® AC power distribution units

8, 13 AND 19 POSITION — REMOTELY CONTROLLED HYDRAULIC-MAGNETIC CIRCUIT BREAKERS ON A DUAL CAN BUS

AC POWER DISTRIBUTION UNIT

8, 13 and 19 position

Maretron
Vessel Monitoring & Control



The AC Power Distribution Unit provides AC circuit protection, remote ON/OFF actuation and status monitoring with single, double or three-pole breakers. Each unit carries **8, 13 or 19 remotely controlled hydraulic-magnetic circuit breakers**, available from 1 to 100 amps.

A 16-bit microprocessor and dual CAN bus communication give both manual and remote actuation.

	Parameter	8 position	13 position	19 position
a	Remotely controlled hydraulic-magnetic breakers / maximum current	8 / 50 amps	13 / 100 amps	19 / 100 amps
b	Dimensions	12.36" × 11.63" × 4.98"	—	20.66" × 13.39" × 4.98"
	Communication / enclosure	Dual CAN bus; white, high strength, injection moulded plastic	Breaker ratings 1 to 100 amps	16-bit microprocessor

ORDERING INFORMATION

AC PDU part number matrix — A3000-X-n

Maretron
Vessel Monitoring & Control

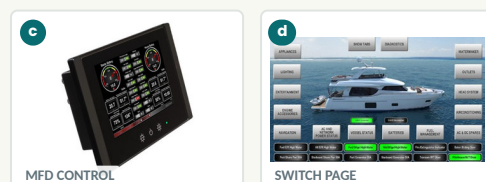
Part number	Description	8 position	13 position	19 position
A3000-X-1	AC Power Distribution Unit - 120V (No Main Breaker)	X	X	X
A3000-X-1M	AC Power Distribution Unit - 120V (With Main Breaker)	X	X	X
A3000-X-2	AC Power Distribution Unit - 120/240V (No Main Breaker)	X	X	X
A3000-X-2M	AC Power Distribution Unit - 120/240V (With Main Breaker)	X	X	X
A3000-X-3	AC Power Distribution Unit - 120/208V (No Main Breaker)	N/A	X	X
A3000-X-3M	AC Power Distribution Unit - 120/208V (With Main Breaker)	N/A	X	X
A3000-X-4	AC Power Distribution Unit - 230V Single Pole (No Main Breaker)	X	X	X
A3000-X-4M	AC Power Distribution Unit - 230V Single Pole (With Main Breaker)	X	X	X
A3000-X-5	AC Power Distribution Unit - 230V Double Pole (No Main Breaker)	X	X	X
A3000-X-5M	AC Power Distribution Unit - 230V Double Pole (With Main Breaker)	X	X	X
A3000-X-6	AC Power Distribution Unit - 230/415V (No Main Breaker)	N/A	X	X
A3000-X-6M	AC Power Distribution Unit - 230/415V (With Main Breaker)	N/A	X	X

Replace X with the number of positions — 08, 13 or 19. Example: A3000-08-4M is an 8-position 230 V single pole unit with a main breaker.

SPECIFYING THE UNIT

Voltage configuration, breakers and main switch

Maretron
Vessel Monitoring & Control



Four decisions define the part number: how many circuits (8, 13 or 19), the AC system voltage, whether a main breaker is fitted, and the individual breaker ratings selected per position from 1 to 100 amps. Supported voltages are single phase 120 VAC and 230 VAC Euro, dual phase 120/240 VAC, and three phase 120/208 VAC or 230/415 VAC.

	Suffix	AC system	Poles	Available on
c	-1 / -1M • -2 / -2M	120 V single phase • 120/240 V dual phase	Single • double	8, 13 and 19
	-3 / -3M	120/208 V three phase	Three	13 and 19
d	-4 / -4M	230 V Euro single phase	Single pole	8, 13 and 19
	-5 / -5M	230 V Euro single phase	Double pole	8, 13 and 19
	-6 / -6M	230/415 V three phase; M suffix = main breaker fitted	Three	13 and 19

Custom Marine schedules the breaker ratings position by position against the vessel's AC load list, so each OctoPlex enclosure arrives populated and labelled for its own circuits.

OctoPlex® DC distribution & system interface

DC POWER DISTRIBUTION UNIT 8 AND 16 POSITION, AND THE SYSTEM INTERFACE UNIT MONITOR

DC POWER DISTRIBUTION UNIT

8 and 16 position

Maretron
Vessel Monitoring & Control



The DC Power Distribution Unit provides DC circuit protection and remote control for up to sixteen DC circuits. **Each circuit has a fully configurable trip profile**, so a channel can be tuned to the load it feeds rather than to the nearest available fuse size.

A multiprocessor-based design is rated for up to 100 amps maximum, and the Electronic Circuit Breakers can be configured to protect DC loads reaching 30 amps per channel. Dual host processors communicate with the Electronic Circuit Breakers and with the CAN networks.

	Part number	Description	Positions	Weight
a	A1650	OctoPlex® DC Power Distribution Unit	8 or 16 DC circuits	5.5 lbs. (2.49 kg) with breakers
b	A1655	OctoPlex® DC Power Distribution Unit	8 or 16 DC circuits	8.25 lbs. (3.74 kg) with breakers

Two part numbers cover the 8 and 16 position units. Maretron publishes them against their fitted weights only — A1650 at 5.5 lbs. (2.49 kg) and A1655 at 8.25 lbs. (3.74 kg) — so confirm the position count against the part number when ordering.

DC PDU SPECIFICATION

Electrical, network and mechanical data

Maretron
Vessel Monitoring & Control

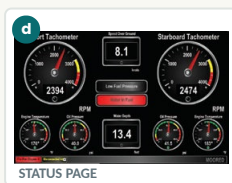
Parameter	Value	Parameter	Value
Input voltage	10 - 32 VDC	Operating temperature range	-40 °C to +55 °C
Maximum current	100 Amps	Dimensions	10.81" × 12.62" × 4.93"
Maximum per channel	30 Amps	CAN bus connectors	Two Micro-C male
CAN output	9 VDC - 16 VDC, 15 VDC nominal	Certifications	NMEA 2000 Category B; Lloyd's Type Approved
Trip profile	Fully configurable per circuit	Standards	IEC 60533 and IEC 60945
Processing	Multiprocessor design, dual host processors	Communication	Electronic Circuit Breakers and CAN networks
Enclosure	White, marine-grade housing with cable glands	Mounting	Bulkhead, adjacent to the loads it feeds

Part numbers, weights and electrical data from the Maretron OctoPlex DC Power Distribution Unit product page, maretron.com.

SYSTEM INTERFACE UNIT MONITOR

SIU – 34 discrete inputs

Maretron
Vessel Monitoring & Control



The System Interface Unit Monitor (SIU) monitors and reports the status for **up to 34 discrete inputs**. It is also suitable for reporting the status of bilge float switches, hatch door open/closed, dimming and similar signals — everything on board that is a contact rather than a load.

	Parameter	Value	Parameter	Value
c	Digital signal capacity	Up to 34 digital signals (DC discrete inputs)	CAN bus voltage	+15 VDC (±0.5)
	Power input	10 - 32 VDC	CAN bus connectors	Two Micro-C male
	Power consumption	100 mA max (@ 28 VDC)	Operating temperature range	-40 °C to +70 °C
d	DC signal input options	Ground, 12 VDC or 24 VDC per input	Dimensions	5.89" × 4.74" × 2.95"
	Weight	1.6 lbs (0.73 kg)	Certifications	NMEA 2000 Category B; Lloyd's Type Approved

SIU specification from the Maretron OctoPlex System Interface Unit Monitor product page, maretron.com. Order code allocated at system build — supply the discrete input schedule with the enquiry.

A DC distribution unit sited in the engine room, another in the flybridge console and a third forward turns three long, heavy load runs into three short ones plus a data cable — which is where the weight and the voltage drop of a traditional panel installation disappear.

OctoPlex® monitors & network power

NETWORK POWER SUPPLY, BATTERY MONITOR AND ACM100 AC POWER MONITOR — THE SENSING SIDE OF THE SYSTEM

NETWORK POWER SUPPLY

Regulated power for the dual NMEA2000 network

Maretron
Vessel Monitoring & Control



The Network Power Supply provides regulated power to the dual NMEA2000 network and diagnostics for the system's redundant CAN bus. It features **redundant AC and DC power inputs**, so the bus stays alive whether the vessel is on shore power, on the generator or on batteries alone.

	Parameter	Value	Parameter	Value
a	Output voltage	+15 VDC (± 0.5)	Operating temperature range	-40 °C to +70 °C
	AC input	90-126VAC; 56Hz - 63Hz, max 2 Amps	Dimensions	7.80" × 8.84" × 3.85"
b	DC input	18VDC - 36VDC, max 6 Amps	Weight	6.0 lbs maximum
	CAN bus connectors	Two Mini female	Certifications	Lloyd's Type Approved, CE marked per IEC 60533

BATTERY MONITOR

Voltage, current and up to four battery temperatures

Maretron
Vessel Monitoring & Control



The Battery Monitor measures and reports one current, two DC voltages and up to four individual battery temperatures. Configurable alarm thresholds for voltage, current and temperature can be displayed via the MFD.

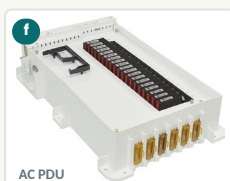
	Parameter	Value	Parameter	Value
c	Measures	1 current, 2 DC voltages, up to 4 battery temperatures	CAN bus voltage / connector	+15 VDC (± 0.5) / one Micro-C male
	Power input (blue wire)	12 VDC - 30VDC, 100 mA max	Operating temperature	-40 °C to +70 °C
d	DC voltage input (red wire)	12 VDC - 30VDC	Dimensions	5.50" × 2.43" × 2.43"
	Shunt voltage (orange/green wires)	50 mVDC	Weight	0.75 lbs (0.34 kg) nominal
	A2225-[]	Battery Monitor Cable Harness — required accessory	MS91587-2	Battery Shunt 200 Amp, 50 mV — required accessory

NMEA 2000® certified, Lloyd's Register Type Approved, complies with IEC 60533 and IEC 60945.

AC POWER MONITOR

Up to four AC lines – voltage, current and frequency

Maretron
Vessel Monitoring & Control



The AC Power Monitor measures and reports the status of up to four AC lines including voltage, current and frequency. It can be used in 110 V, 220 V, three phase and 240 V European applications.

	Parameter	Value	Parameter	Value
e	Input capability	Up to 4 single phase single line AC inputs, 2 single phase dual line, or 1 three phase three line	Voltage range	90VAC - 264VAC
f	Operating frequency	50/60 Hz	Dimensions	7.52" × 8.51" × 2.67"
	CAN connections	Two Micro-C male, dual configuration for redundancy	Weight	3.6 lbs (1.64 kg)
	Operating temperature	-40 °C to +70 °C	Certifications	Lloyd's Type Approved, NMEA 2000 Category B

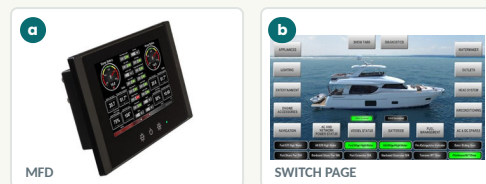
OctoPlex® user interface & software

MULTI-FUNCTION DISPLAY, WSV100 MCONNECT WEB SERVER AND N2KVIEW® V3 VESSEL MONITORING SOFTWARE

MULTI-FUNCTION DISPLAY

The main human interface of the system

Maretron
Vessel Monitoring & Control



A configurable 8 or 12.1-inch dedicated Multi-Function Display provides an extremely simple interface for system control and monitoring. Acting as the main human interface of the system, the MFD brings system functions, status reports and alarms directly to the user.

	Interface	Shows and controls	Screen
a	Dedicated Multi-Function Display	AC and DC circuit switching, breaker status, alarms and system functions — fully configurable and customisable	8-inch or 12.1-inch
b	Third-party MFD support	Pages displayed on marine MFDs that support remote HTML servers, including Garmin OneHelm and Raymarine® Axiom	Via MConnect
	Mobile and desktop	N2KView® V3 on phones, tablets, PCs and Macs, onboard and remotely	Any device

MCONNECT WEB SERVER

WSV100 – HTML5 gateway to the NMEA 2000® network

Maretron
Vessel Monitoring & Control



MConnect provides an HTML5 gateway solution for users to interface with the NMEA2000® network on their computers and mobile devices, and supports integration with MFD manufacturers including Garmin OneHelm and Raymarine® Axiom. It has direct connections to two NMEA 2000 busses and receives data from both independently, so primary and secondary busses — or independent navigation and monitoring busses — are monitored without a bridge.

	Part number	Feature	Feature
c	WSV100	MConnect HTML5 Web Server — IP67 rated	Dual CAN bus for single or redundant NMEA 2000® network connections
d	—	USB 3.0 port · RJ45 Ethernet port	Supports simultaneous access from up to 4 users
	—	9-32 volt power input, reverse polarity protected	5 watt power usage · engaging HTML5 user interface experience

ORDERING SUMMARY

OctoPlex® G2-Series system components

Maretron
Vessel Monitoring & Control

Part number	Component	Role in the system
A3000-X-1 to -6M	AC Power Distribution Unit, 8 / 13 / 19 position	AC circuit protection, remote ON/OFF actuation and status monitoring
A1650	DC Power Distribution Unit — 5.5 lbs. (2.49 kg) fitted	DC circuit protection and remote control, configurable trip profile per circuit
A1655	DC Power Distribution Unit — 8.25 lbs. (3.74 kg) fitted	DC circuit protection and remote control, configurable trip profile per circuit
AC Power Monitor	Up to four AC lines, 90VAC - 264VAC, 50/60 Hz	Voltage, current and frequency reported to the MFD
A2225-[]	Battery Monitor Cable Harness	Required accessory for the Battery Monitor
MS91587-2	Battery Shunt 200 Amp, 50 mV	Required accessory for the Battery Monitor
WSV100	MConnect HTML5 Web Server	HTML5 gateway for computers, mobile devices and third-party MFDs
Battery Monitor	12 / 24 VDC, one high-side current, four battery temperatures	Configurable alarm thresholds displayed via the MFD
System Interface Unit Monitor	Up to 34 discrete inputs	Bilge float switches, hatch open/closed, dimming and similar
Network Power Supply	Redundant AC and DC inputs, +15 VDC output	Regulated power and diagnostics for the dual CAN bus
Multi-Function Display	8 or 12.1-inch dedicated display	Main human interface — control, status reports and alarms
N2KView® V3 Software	Onboard and remote vessel monitoring	Runs on PC, Mac, tablet and smartphone

Where no published order code exists the unit is configured and numbered at system build. Part numbers and specifications on this page are taken from the OctoPlex G2-Series brochure, the Maretron catalogue and the Maretron product pages at maretron.com.