

Maretron

Leading the way in NMEA 2000® technology



PRODUCT CATALOG **2010**



2010









www.maretron.com



Contents

2010 PRODUCT CATALOG

Maretron designs, manufactures and markets leading-edge networked electronics for the marine marketplace. Maretron's products are designed to the open industry NMEA 2000® standard, which allows electronic equipment from diverse manufacturers to be networked together for sharing information throughout the vessel. Maretron's corporate philosophy is to provide premium quality, state-of-the-art marine electronics that work in conjunction with traditional navigation techniques for the highest level of safety and performance while boating.

-  ***PC Software/Interfacing***
-  ***Displays & Alarms***
-  ***Navigation Instruments***
-  ***Engine/Vessel Monitoring***
-  ***Cables and Connectors***
-  ***Network Installation Guide***



866-550-9100

World-class standards in navigational and vessel monitoring electronics.

Simpler, safer boating. Freedom of choice. Those are the guiding principles behind Maretron.

All the products we develop are designed to perform in the open plug-and-play network, the National Marine Electronics Association standard (NMEA 2000®). Why? Because no other network provides the same degree of flexibility, allowing you to buy best-in-class instrumentation – no matter who manufactures it.

Maretron was founded by engineers who designed integrated circuits for the automotive industry. No other industry has perfected networked electronics to the same degree. Avid boaters, they saw a unique opportunity to transport this technology to marine electronics.

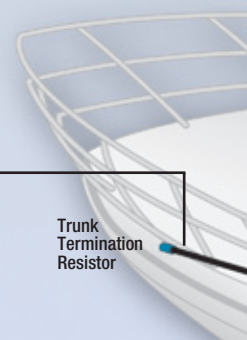
The result? A growing line of networked products that install simply and perform with increased reliability. Products that allow you the freedom of choice to select components from your favorite brands of electronic components.

Maretron. We may be the newest name in marine electronics, but we intend to lead the way to simpler, safer boating.

www.maretron.com

Maretron's USB100 is a gateway for bridging USB equipped computers with the NMEA 2000® network so you can continue to use PC-based navigation software or you can view critical vessel systems using Maretron's vessel monitoring software (N2KView).

The NMEA 2000® standard is a serial data communications network for interconnecting marine electronic equipment where all data is transferred over a single network cable. Maretron is leading the way by introducing the first "NMEA 2000® Approved" connectors and cables.



Trunk Termination Resistor

Maretron's DST100 Smart™ Retractable Depth/Speed/Temperature Transducer delivers precise digital depth, accurate speed and exact water temperature even at speeds above 40 knots.

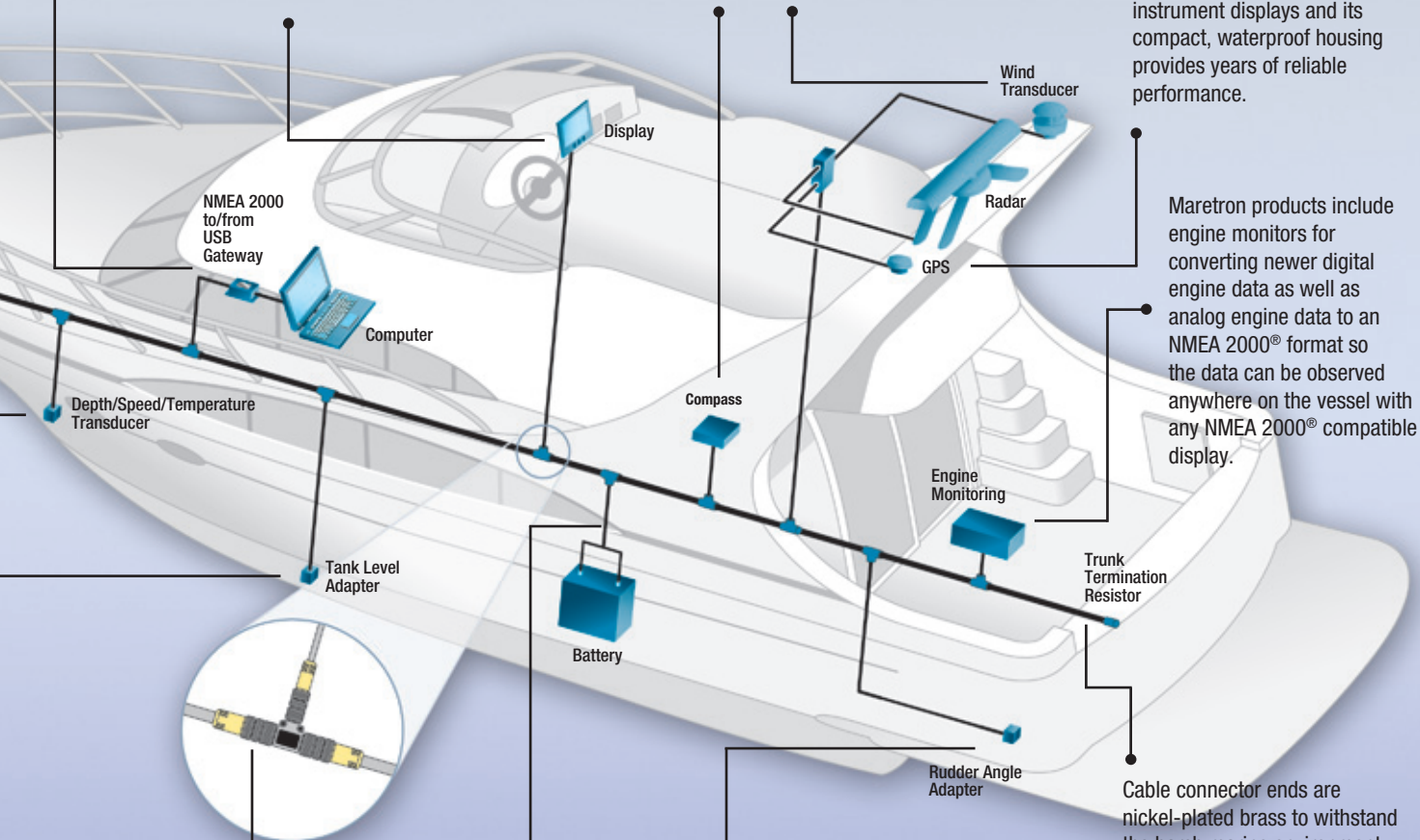
Maretron's TLA100 is used to adapt commercially available resistive tank senders to the NMEA 2000® network. This allows you to observe tank levels anywhere on the vessel where there is an NMEA 2000® compatible display such as the Maretron DSM200 or DSM250.

Maretron's color (DSM250) display is a 5.7" easy to use display for monitoring any or all NMEA 2000® network data including engine gauges, navigational information, environmental data, tank levels, and much more.

Maretron's SSC200 is a solid state rate gyro compass with no moving parts and, unlike a flux gate compass that sloshes around during turns or pitching seaways, the SSC200 continues to provide accurate heading information. The result is increased fuel economy and reduced wear and tear on your autopilot since S-turning about the desired course is reduced.

Maretron's WS0100 is an ultrasonic wind and weather station that measures wind speed and direction, air temperature, barometric pressure, and relative humidity. The wind measurement is performed using ultrasonic sensors, which means there are no moving parts to wear out or to get caught in the rigging.

Maretron's GPS200 is a global positioning system antenna/receiver that incorporates the latest WAAS technology for accurate position fixes. The GPS200 connects directly to an NMEA 2000® network and communicates with navigational software, chart plotters, autopilots and dedicated instrument displays and its compact, waterproof housing provides years of reliable performance.



Maretron products include engine monitors for converting newer digital engine data as well as analog engine data to an NMEA 2000® format so the data can be observed anywhere on the vessel with any NMEA 2000® compatible display.

Network topology includes simple tee connections (or drops) where devices can be connected or disconnected from the trunk line under power without disturbing the rest of the network.

Single network cable provides power as well as communication signals which eliminates the need for separate power connections.

Maretron's RAA100 is used to adapt commercially available resistive rudder angle senders to the NMEA 2000® network. This allows you to observe rudder angle anywhere on the vessel where there is an NMEA 2000® compatible display such as the Maretron DSM200 or DSM250.

Cable connector ends are nickel-plated brass to withstand the harsh marine environment and are keyed for error-free connections. Screw thread connector ends reduce chances of accidental disconnects of essential equipment. All connections are waterproof and continue to work even while they are submerged in the bilge.

PC Software/ Interfacing

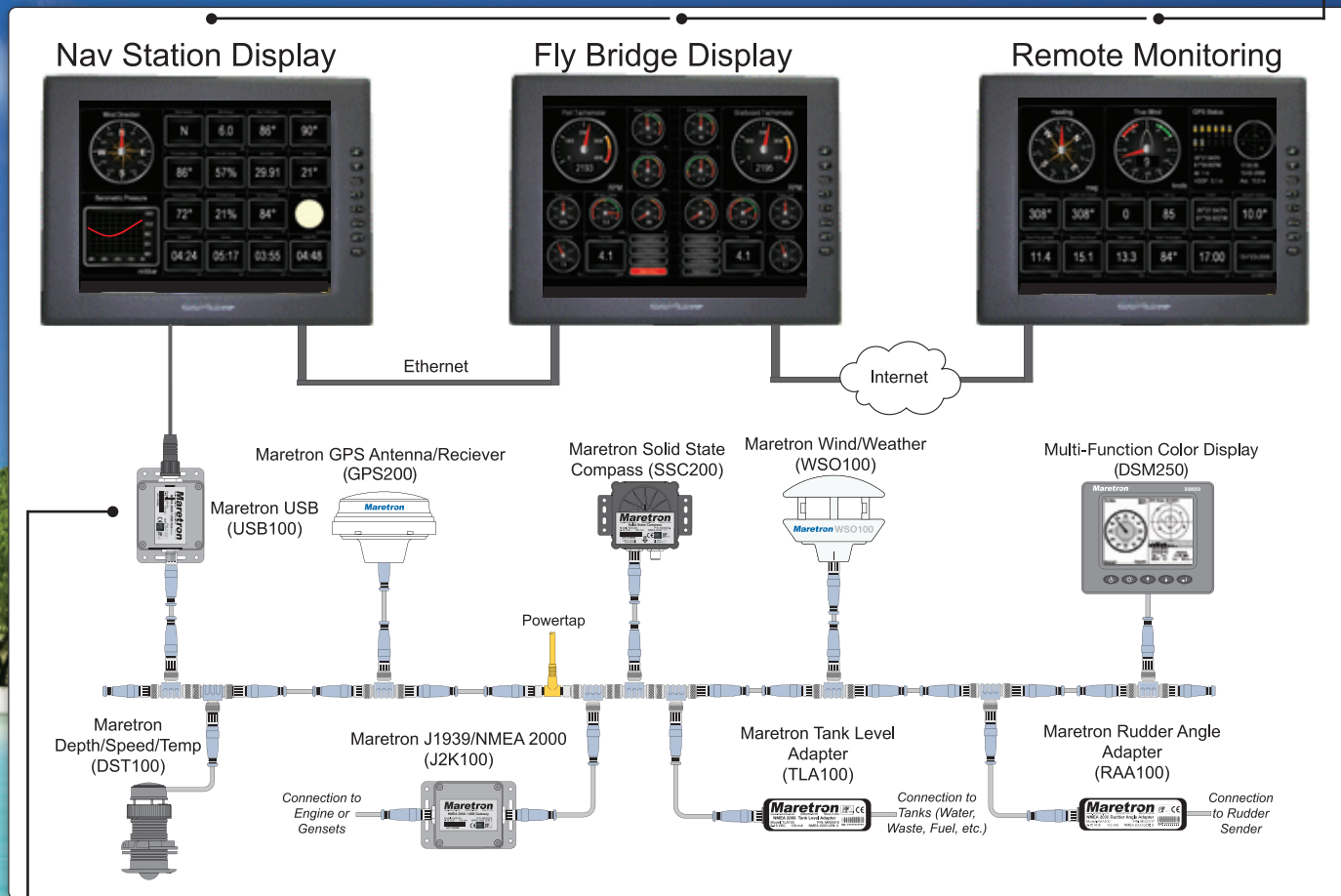
- N2KView®
- USB100



Maretron brings world-class vessel monitoring systems to the PC using state of the art networking technology. Now you can monitor all critical vessel systems including engines, gensets, tanks, rudder, navigation instruments, local weather, electrical systems and more, all using an open industry standard for true plug-and-play compatibility.

Maretron's vessel monitoring and control software (N2KView®) provides unprecedented access to all your vessel's systems through multiple configurable screens.*

**Control refers to specific electrical distributed power systems that are based on NMEA 2000® networking.*



Maretron's USB gateway (USB100) bridges the gap between an NMEA 2000® network and a PC using one simple USB connection.

N2KView®

Vessel Monitoring and Control Software

Whether you are interested in monitoring your vessel's systems while underway or remotely from your home or office, Maretron's N2KView® software displays the information you need including engines, gensets, tanks, rudders, navigation instruments, local weather, electrical systems and more.

N2KView® is completely user-configurable and you are free to design different screens to your exact needs while easily switching from screen to screen for monitoring all your systems. Digital displays, analog gauges, graphic displays, warning lights, bar graphs, all can be configured exactly how you want them to be. You can even set the operating limits and color bands for analog gauges so you know when things are within limits and when they are not.

Once you connect a PC to the NMEA 2000® network using the Maretron USB100 gateway, you can connect other PCs or handhelds using conventional technology like Ethernet or Wi-Fi for remote viewing of things like tank levels up on deck while fueling, or for monitoring the vessel's location anywhere in the world using an Internet connection back to the boat.



**Engine
View**



**Electrical
Systems View**

Environmental View



Navigation View



Windows PC Server/Client System Requirements

Parameter	Value	Comment
Operating System	Windows XP Home Edition/Professional	Latest Service Pack may be Required for Support
	Vista	Latest Service Pack may be Required for Support
CPU Minimum	Pentium® 4 or Equivalent	
CPU Recommended	Pentium® 4, (3.0 GHz)	
Memory Minimum	512 MB RAM	
Memory Recommended	1 GB RAM	
Hard Drive Space	40 MB	
CD-ROM or DVD Drive	Single	Required to Load Software
Video Card Minimum	128 MB	
Video Card Recommended	256 MB	
USB Ports	Two USB Ports – 1.1 or 2.0 Compatible	One Port for Software License Key, One for Maretron Gateway
Ethernet Port	10BASE-T or 100BASE-TX, or 802.11a/b/g	Only Required for Remote Monitoring
Display	1024x768 Resolution, 32-bit Color Video	
Multiple Monitor Support	Dedicated Video Cards 64 MB RAM per	
Certification	NMEA 2000® Standard	Approved

Products

PART NUMBER	DESCRIPTION
N2KView-SC	N2KView Basic Software
N2KView-C	N2KView Basic Software (Additional Station)
N2KView-SCP	N2KView Platinum Software
N2KView-CP	N2KView Platinum Software (Additional Station)



USB100 *NMEA 2000®* USB Gateway

Maretron's USB100 is a gateway for bridging computers to an NMEA network. This allows you to use PC based vessel monitoring and control software like Maretron's N2KView® or PC based navigation software. The gateway provides one simple connection between the network and the PC, which eliminates conventional multiplexers and the maze of wires usually associated with interfacing equipment to PCs.

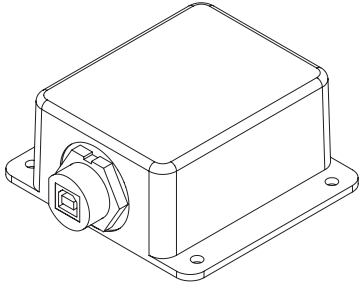
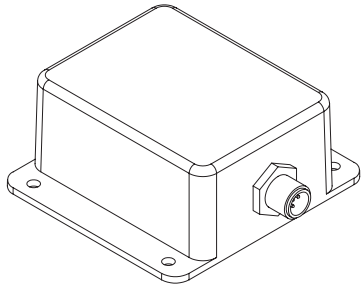
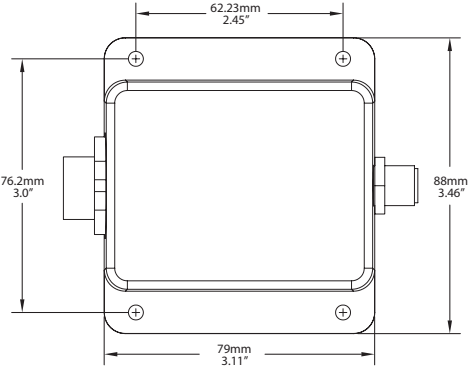
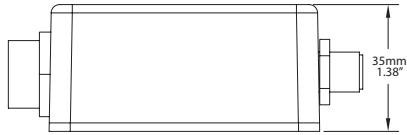
For older PC based navigation software that requires receiving data in NMEA 0183 format, the USB100 automatically converts information from the NMEA 2000® network to NMEA 0183 sentences. You can continue benefiting from navigational and charting software that you already own while enjoying the many benefits of networked NMEA 2000® instruments.



Maretron's USB100 gateway bridges the gap between NMEA 2000® networks and PCs equipped with a USB port. You can continue benefiting from navigational and charting software that you already own while enjoying the many benefits of networked instruments.

Products

PART NUMBER	DESCRIPTION
USB100-01	Gateway NMEA 2000® / USB



Specifications

Parameter	Value	Comment
NMEA 2000® Connector	DeviceNet Micro-C	Industry Standard Waterproof
NMEA 2000® / USB Isolation	Opto-Isolated	No Electrical Connection Across Bridge
USB Standard	USB 1.1	
USB Connector	USB Type B	Industry Standard Waterproof
USB Supported Signals	D+, D-, +5V, GND	Bi-directional Gateway
USB Auxiliary Power	+5 Volts < 50 mA	
USB Baud Rate	Up to 12 Mb/s	Full Speed USB Data Rate
USB Interface Modes	NMEA 0183	With Maretron-Supplied Windows® Drivers
	Native NMEA 2000®	With Maretron-Supplied API

Certifications

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

Translated Data Types (NMEA 2000® to NMEA 0183)

Instrument Type	Data Types
Battery Monitor	Voltage, Current, Temperature
Compass	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	Rudder Position
Speed	Distance Log, Speed
Weather Station	Water Temperature
Wind	Wind Direction and Speed

Electrical

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	DC Voltage
Power Consumption	< 150mA	Average Current Drain
Load Equivalence Number (LEN)	3	NMEA 2000® Spec. (1 LEN = 50mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated Per SAE J1113

Mechanical

Parameter	Value	Comment
Size	3.11" x 3.46" x 1.38" (79mm x 88mm x 35mm)	Including Flanges for Mounting
Weight	8 oz. (227 g)	

Environmental

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
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 Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



Displays & Alarms

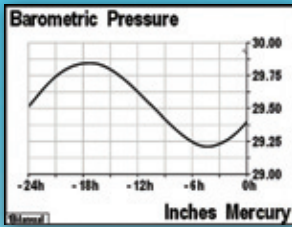
- DSM250
- ALM100

Maretron offers a multi-function color display that can be used at multiple locations throughout the vessel. The universal display delivers the information you need, when and where you need it. The DSM250 is a high-resolution LCD screen that is readable in bright sunlight and waterproof to IP67 rating. Its displays provide a wide array of information including AC power, battery, depth, engine, environment, fuel management, GPS, heading, navigation, rudder, speed, tanks, time, transmission, weather, wind and more.

Maretron's DSM250 is completely user configurable and you can scroll from screen to screen automatically or with a single push of a button. Pictured to the right are just a few of the many possible screen configurations.

Also provided as a user interface to the NMEA 2000® network is the Maretron alarm buzzer (ALM100). A super loud buzzer for alerting you to alarm conditions. The buzzer is waterproof so it can be mounted outdoors as well as indoors, and it includes a baffle to reduce noise in confined spaces.

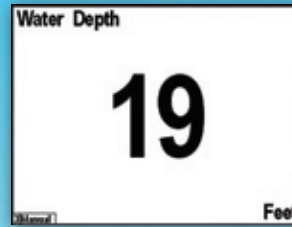




Barometric Pressure Graph



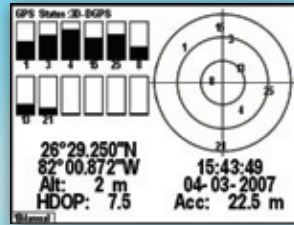
Course Up Heading



Single Numeric Depth



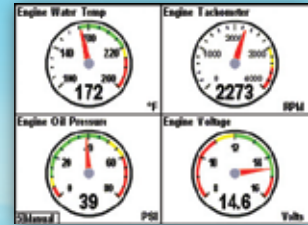
Dual SOG and COG



GPS Status



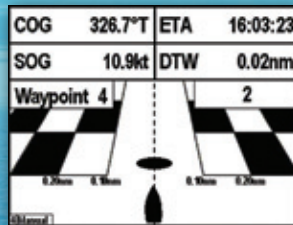
Moon Phase



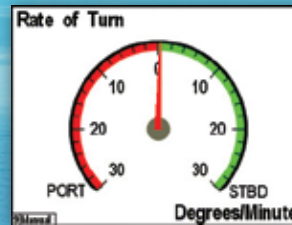
Quad Engine Gauges



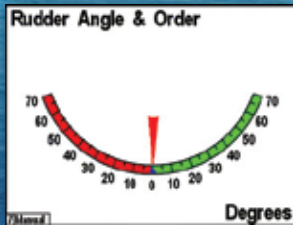
Quad Numeric



Rolling Road



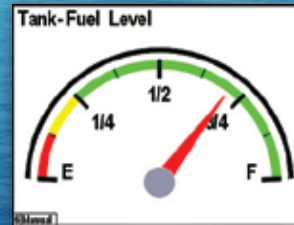
Swing Meter



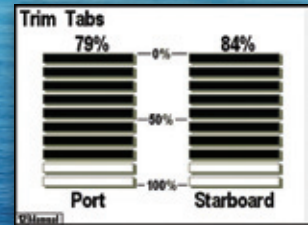
Rudder Angle



Single Tachometer



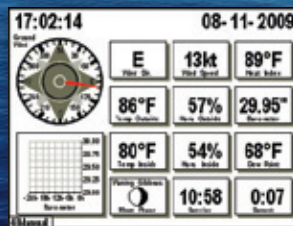
Single Tank Gauge



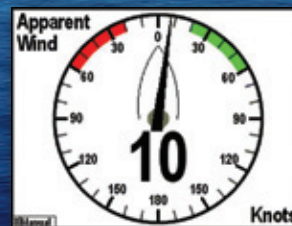
Trim Tabs



Tri-Display



Local Weather



Wind Speed and Direction

DSM250 *Multi-Function Color Display*



Maretron's DSM250 is a high-resolution sunlight viewable color display that allows easy interpretation of NMEA 2000® instrument and navigation data through custom display configurations, featuring an easy-to-use five-key illuminated keypad.

Unlike traditional single-display units, DSM250 users can choose numeric, gauge, or graph formats in single or multiple displays, with cycling options possible for a wide range of favorite data. These multiple display options conserve mounting space and reduce overall system cost.

The DSM250 will directly connect with any NMEA 2000® network and display any or all information captured throughout the vessel. Various audio and visual alarms are also programmable.

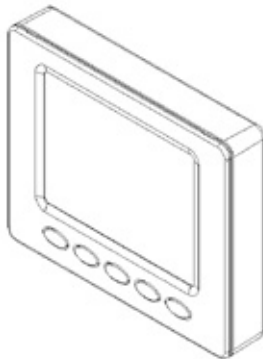
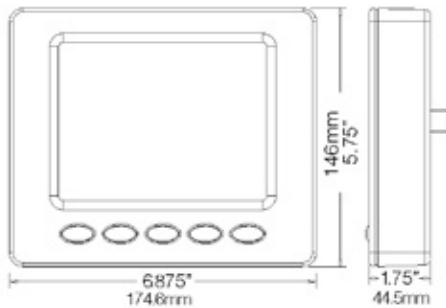
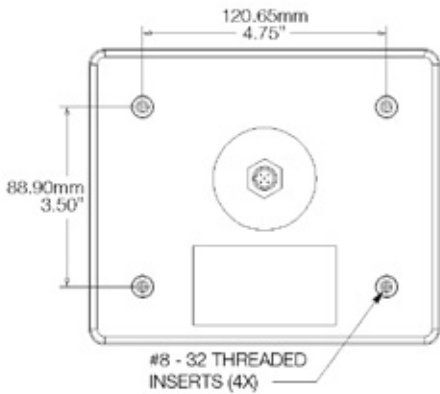
The DSM250 displays a multitude of information including AC power, battery, depth, engine, environment, fuel management, GPS, heading, navigation, rudder, speed, tanks, time, transmission, weather, wind and more.

Maretron's DSM250 is engineered and manufactured to the highest standards (IEC 60945 Maritime Navigation and Radio communication Equipment). Its compact waterproof housing will provide years of reliable performance. The DSM250 is available in three different color cases: black, gray, or white.

Products

PART NUMBER	DESCRIPTION
DSM250-01	High Bright Color Display (Black Enclosure)
DSM250-02	High Bright Color Display (Gray Enclosure)
DSM250-03	High Bright Color Display (White Enclosure)
DSMMNTASSBLY	DSM200/DSM250 Gimbil Mount
DSM250CVR2PK-01	Package of (2) Black DSM250 Covers
DSM250CVR2PK-02	Package of (2) Gray DSM250 Covers
DSM250CVR2PK-03	Package of (2) White DSM250 Covers





Certifications

Parameter	Value	Comment
NMEA 2000® Connector	DeviceNet Micro-C	Industry Standard Waterproof
Display Technology	Active Matrix TFT LCD	Sunlight Readable
Display Resolution	320 x 240 Pixels	QVGA Resolution
Display Viewable Area	117mm W x 88mm H	5.7" Diagonal
Display Backlighting	CCFL	3-User-Programmed Levels 0-100%
Keyboard	5 Silicone Rubber Keys	Multi-Colored LED Backlighting
Languages Supported	English, Dutch (Nederlands)	User Selectable

Specifications

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

Supported Data Display Types

Instrument Type	Data Types
AC Power	Voltage, Current, Frequency, Line-Neutral Voltage, Line-Line Voltage, Real Power, Reactive Power, Apparent Power, Power Factor, KWH Import, KWH Export
Battery	Voltage, Current, Temperature, State of Charge, State of Health, Time Remaining, Ripple Voltage, Power
Depth	Water Depth, Transducer Offset
Engine Monitor	Tach., Eng. Hrs., Oil, Coolant, Boost & Fuel Pres., Voltage, Oil & Coolant Temp., Fuel Rate, Tilt/Trim
Environment	Barometer, Heat Index, Hum. Inside & Outside, Moon Phase, Sunrise, Sunset, Temp. Dew Point, Temp. Eng. Room, Temp. Inside, Temp. Sea, Twilight AM & PM, Wind Chill
Fuel Management	Total Fuel Rate, Total Fuel Economy, Total Fuel Remaining
GPS	COG, SOG, DOP, Position, Satellites, Time
Heading	Heading, Rate of Turn, Variation
Navigation	BOD, Drift, Set, XTE, TTG, ETA, VMG, DTW, BTW, Rolling Road, Datum, Waypoint Number & Name, COG, SOG
Rudder Indicator	Rudder Position and Order
Speed	Through Water, Over Ground, Total Log, Trip Log
Tank Monitor	Capacity, Level, Remaining
Time	Date Local, Date UTC, Time Local, Time UTC
Transmission	Gear, Oil Pressure, Oil Temperature
Trim Tabs	Bar Graph
Wind	Apparent Direction and Speed, True Direction and Speed, Ground Direction and Speed

Electrical

Parameter	Value	Comment
Operating Voltage	9 to 32 Volts	DC Voltage
Power Consumption (Maximum)	< 650mA	Low Supply, Full Brightness
	< 200mA	Nominal Supply, Low Brightness
Load Equivalence Number (LEN)	13	NMEA 2000® Spec. (1 LEN = 50mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated Per SAE J1113

Mechanical

Parameter	Value	Comment
Size	6.875" x 5.75" x 1.75" (174.6mm x 146mm x 44.5mm)	Including Flanges for Mounting
Weight	26 Oz. (737g)	
Mounting	Surface or Flush Mount	

Environmental

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40° to 70°C
Relative Humidity	93%RH @ 40°C per IEC 60945-8.2
Vibration	2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s² per IEC 60945-8.7
Rain and Spray	12.5mm Nozzle @ 100liters/min for 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 7 days @ 40°C, 95%RH after 2 hour Salt Spray per IEC 60945-8.12
Electromagnetic Emission	Conducted and Radiated Emission per IEC60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



ALM100 *Alarm Module*

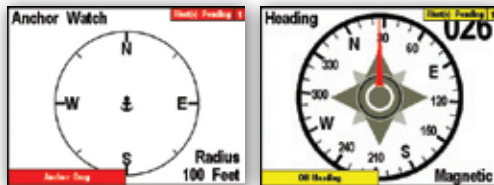
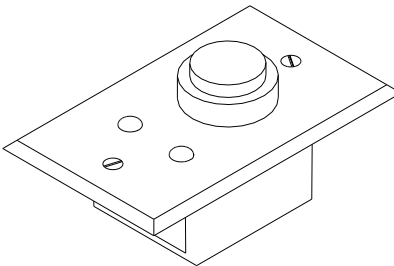
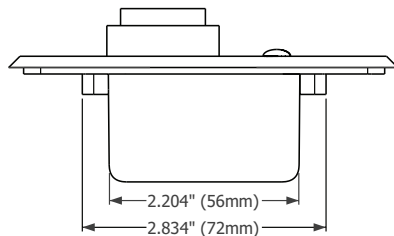
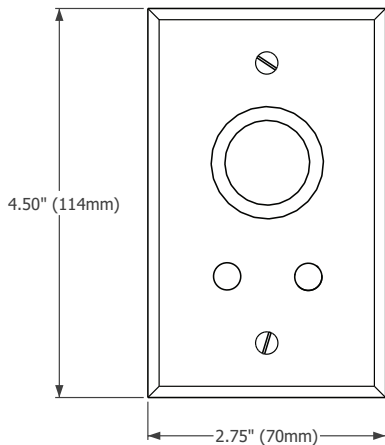
Maretron's Alarm Module generates visual and audible alerts for any monitored condition. The Alarm Module includes an extremely loud 105 dB SPL Piezoelectric sounder, along with a red high-brightness LED to indicate an alarm condition. A second green LED indicates that the Alarm Module is powered and ready to be triggered. The audible alarm can sound any one of 32 distinct pre-programmed patterns to indicate different alerts. The Alarm Module can be triggered by alarms generated by Maretron's N2KView® Vessel Monitoring System, or by Maretron's DSM250 Color Graphics Display. The Alarm Module mounts in a standard electric box or can be flush mounted on any surface. Completely waterproof, the Alarm Module can be mounted inside or outside the vessel.



- NMEA 2000® Network Interface
- Super loud 105dB audible alarm
- Bright Red LED visual alarm
- Green LED status indicator
- Mounts in standard electrical wall box or flush mount directly in wall
- 32 selectable alarm patterns
- Waterproof - Can be mounted indoors or outdoors

Products

PART NUMBER	DESCRIPTION
ALM100-01	Alarm Buzzer with Black Cover Plate
CP-BK-ALM100	ALM100 Black Cover Plate
CP-WH-ALM100	ALM100 White Cover Plate



DSM250 Screen Shots

Specifications
Certifications

NMEA 2000® Parameter Group Numbers (PGNs)

Parameter	Value	Comment
Annunciator Volume	105 dB SPL	Mechanical Volume Control
Annunciator Frequency	2.9 kHz	

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	128720	Proprietary Alarm Status*	1 time/second
	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA	N/A
	128720	Configuration	N/A
Maretron Proprietary PGNs	128720	Configuration	N/A

*Future firmware updates will allow the ALM100 to be in conformance with the upcoming NMEA 2000 alarm messaging protocol, once it is defined.

Electrical

Parameter	Value	Comment
Operating Voltage	9 to 32 Volts	DC Voltage
Power Consumption	100 mA	NMEA 2000 Interface
Load Equivalence Number (LEN)	2	NMEA 2000® Spec. (1LEN = 50 mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Mechanical

Parameter	Value	Comment
Size	2.75" x 4.50" x 2.00" (70mm x 114mm x 51mm)	Including wall plate – Mounts in standard single-gang electrical box
Weight	13 oz. (368.5g)	

Environmental

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



Navigation Instruments

- WSO100
- SSC200
- GPS200
- DST100

Maretron brings you state-of-the-art, award-winning navigation instruments.

Take our compass, for example. We were the first to bring solid-state compass technology to the marine industry, resulting in superior accuracy and incredible response time. The result – rock solid radar overlay on your charting software and unprecedented autopilot performance.

Our ultrasonic wind/weather station is another example of award-winning technology – no moving parts and built from the ground up for the marine industry. Aerodynamically designed for accurate wind speed and direction even when the boat is heeled over in pitching and rolling seas.

And of course, all our navigation instruments are engineered to the highest international marine standard (IEC 60945) for years of reliable service.



SAIL honors Freeman K. Pittman's memory with its annual FKP Awards, which recognize the finest and most innovative new products on the market—the very stuff that Freeman sought out during his tenure at the magazine.



The NMMA Innovation Awards are presented each year at the Miami Boat Show and they recognize products that exhibit innovative distinction from other products, benefit to the marine industry and/or consumer, practicality, and cost-effectiveness.



WSO100 *Ultrasonic Wind and Weather Station*

Maretron's outdoor weather station measures wind speed and direction, air temperature, barometric pressure, and relative humidity. The wind measurement is performed using ultrasonic sensors, which means there are no moving parts to wear out or to get caught in the rigging.

The WSO100 accurately measures wind speed and direction even when tilted, making it ideally suited for heeled sailboats or powerboats operating in pitching and rolling seaways.

When used with Maretron displays (DSM250/N2KView®), you can view apparent wind speed and direction, humidity, air temperature, barometric pressure (with graphs to see trends), wind chill factor, heat index, and dew point. If you add speed through water (DST100), GPS (GPS100) and compass (SSC200), you can view true vessel referenced wind speed and direction as well as ground referenced speed and direction.



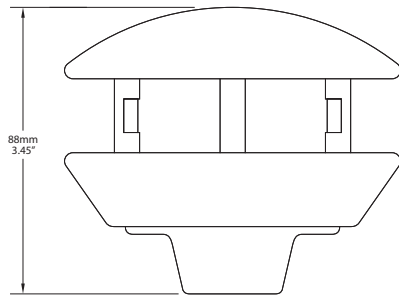
The WSO100 provides these functions:

- Apparent Wind Speed
- Apparent Wind Direction
- Atmospheric Pressure
- Air Temperature
- Relative Humidity

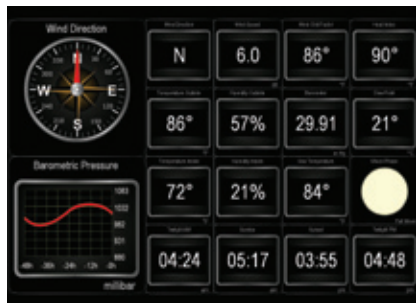
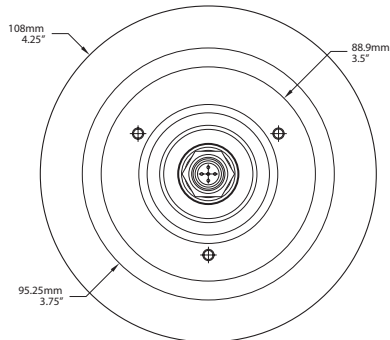
Products

PART NUMBER	DESCRIPTION
WSO100-01	Ultrasonic Wind/Weather Station

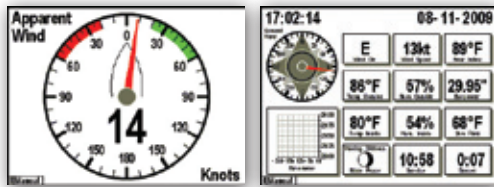




1" - 14 - UNS-2B Thread
(1" - 14 TPI Standard Marine Mount)



N2KView Environment Screen



DSM250 Screen Shots

Specifications

Parameter	Value	Comment
Wind Speed Range	0.5 to 99.5 knots (1 to 185 kph)	
Wind Speed Resolution	0.1 knot (0.19 kph)	
Wind Speed Accuracy	± 5% or 1 knot (1.9 kph)	Tilt 0° (operates to 30° tilt)
Wind Direction Accuracy	± 5°	Tilt 0° (operates to 30° tilt)
Temperature Range	-25° to 55° C	
Temperature Resolution	0.1°F (0.06°C)	
Temperature Accuracy	±1.8°F (1°C)	
Relative Humidity Range	0-99% RH	
Relative Humidity Resolution	1% RH	
Relative Humidity Accuracy	± 4% RH ± 5% RH	0% to 80% RH 80% to 99% RH
Barometric Pressure Range	26 to 32" Hg (880 to 1080 mb)	
Barometric Pressure Resolution	0.03" Hg (1 mb)	
Barometric Pressure Accuracy	±0.1" Hg (±3.4 mb)	

Certifications

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers (PGNs)

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	130306	Wind Data	10 Times/Second
	130310	Environmental Parameters	10 Times/Second
	130311	Environmental Parameters	2 Times/Second
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
	059392	ISO Acknowledge	N/A
Protocol PGNs	059904	ISO Request	N/A
	060416	ISO Transport Protocol, Connection Management	N/A
	060160	ISO Transport Protocol, Data Transfer	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA Complex Request/Command/Ack.	N/A
	126720	Configuration	N/A
Maretron Proprietary PGNs	126720	Configuration	N/A

Electrical

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	DC Voltage
Power Consumption	<150mA	Average Current Drain
Load Equivalence Number (LEN)	3	NMEA 2000® Spec. (1LEN = 50 mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Mechanical

Parameter	Value	Comment
Size	4.25" Dia. x 3.45" Tall (108mm Dia. x 88mm Tall)	Including Mounting Bracket
Weight	10 oz. (283g)	Including Mounting Bracket
Mounting	Pole	Fits 1"-14 TPI Standard Marine Mount

Environmental

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



SSC200 *Solid State Compass*

Maretron's SSC200 is a solid state, rate gyro electronic compass that provides better than 1° heading accuracy through $\pm 45^\circ$ of roll and pitch angle, and better than 1° roll and pitch accuracy in static conditions. Each SSC200 is factory calibrated for maximum accuracy. It delivers precise, reliable heading information ten times per second, plus vessel attitude including pitch and roll readings once per second. A micromachined rate gyro is used by advanced stabilization algorithms to provide accurate, stable readings during dynamically changing conditions such as hard turns or rough seas, making it an ideal heading sensor for autopilot applications.

Maretron's SSC200 is certified to the NMEA 2000® network standard and compatible with the NMEA 0183 digital interface standard. It connects directly with any NMEA 2000® network and/or NMEA 0183 listeners to share information with navigational software, chart plotters, autopilots, and dedicated instrument displays – including Maretron's DSM250 graphical display.

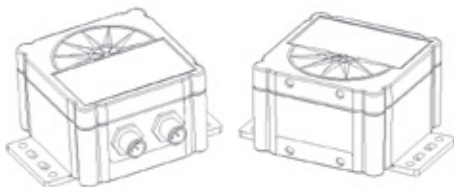
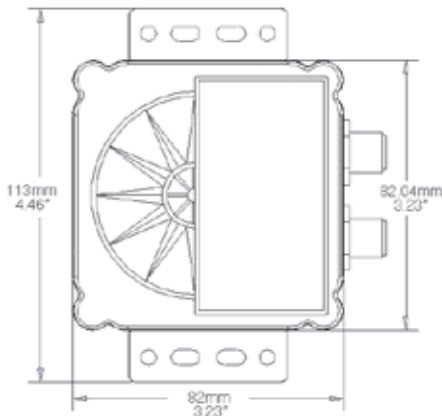


The SSC200 can be automatically calibrated for deviation. Its dynamic accuracy is improved with advanced digital filtering of the 3-axis magnetometer, 2-axis accelerometer and rate gyro.

The SSC200 is engineered and manufactured to the highest standards (IEC 60945 Maritime Navigation and Radio Communication Equipment). Its compact waterproof housing will provide years of reliable performance.

Products

PART NUMBER	DESCRIPTION
SSC200-01	Solid-State Rate/Gyro Compass



DSM250 Screen Shots

Copyright 2009 Maretron, LLP. All rights reserved. As Maretron is constantly improving its products, all specifications are subject to change without notice. Maretron's products are designed to be accurate and reliable; however, they should be used only as aids to navigation and vessel monitoring, and not as a replacement for traditional navigation and vessel monitoring techniques. A prudent captain or navigator never relies on a single source for navigation or system monitoring information. "NMEA 2000" is a registered trademark of the National Marine Electronics Association.



Specifications

Parameter	Value	Comment
Static Heading Accuracy	<1° RMS	±45° Pitch and Roll - 15°C to 35°C
Heading Display Resolution	0.1°	With Maretron Display
Settling Time	1 Second	To Static Accuracy after 35°/Second Turn
Heading Update Rate	10 per Second	
Heading Deviation	Yes	Automatic
Alignment Calibration	Yes	In Boat Calibration with Maretron Displays
Pitch and Roll Range	±80°	With Maretron Display
Pitch and Roll Accuracy	<1°	±45° Pitch and Roll - 15°C to 35°C
Pitch and Roll Display Resolution	0.1°	With Maretron Display
Pitch and Roll Update Rate	1 per Second	
Pitch and Roll to Boat Alignment	Yes	In Boat Calibration with Maretron Displays
Rate of Turn Range	0° - 90°/ Second	At 0° Pitch and Roll
Rate of Turn Accuracy	±1° per Second	0° Pitch and Roll - 15°C to 35°C
Rate of Turn Update Rate	10 per Second	
NMEA 0183 Standard	Compatible	Up to 38,400 Baud (40 Hz Update Rate)

Certifications

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers (PGNs)

Description	PGN #	PGN Name	Default Rate	
Periodic Data PGNs	127250	Vessel Heading	10 Times/Second	
	127257	Attitude	1 Time/Second	
	127251	Rate of Turn	10 Times/Second	
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A	
	126996	Product Information	N/A	
	126998	Configuration Information	N/A	
	059392	ISO Acknowledge	N/A	
Protocol PGNs	059904	ISO Request	N/A	
	060416	ISO Transport Protocol, Connection Management	N/A	
	060160	ISO Transport Protocol, Data Transfer	N/A	
	060928	ISO Address Claim	N/A	
	065240	ISO Address Command	N/A	
	126208	NMEA Request/Command/Acknowledge	N/A	
	Maretron Proprietary PGNs	126720	Configuration	N/A

NMEA 0183 Sentences

Sentence	Acronym	Sentence Name	Description
Transmitted Sentences	HDG	Heading, Deviation, and Variation	10 Times/Second
	HDM	Heading, Magnetic	N/A
	HDT	Heading, True	N/A
	ROT	Rate of Turn	5 Times/Second
	PMAROUT	Maretron Proprietary Attitude (Pitch and Roll)	1 Time/Second
	TXT	Text Transmission	N/A
Received Sentences	RMC	Recommended Minimum Specific GNSS Data	N/A
	VTG	Course Over Ground and Ground Speed	N/A

Environmental Mechanical Electrical

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	DC Voltage
Power Consumption	< 150mA	Average Current Drain
Load Equivalence Number (LEN)	3	NMEA 2000® Spec. (1 LEN = 50mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated Per SAE J1113

Parameter	Value	Comment
Size	4.46" x 3.23 x 2.14" (113mm x 82mm x 54mm)	Including Mounting Flanges
Weight	7 Oz. (198 g)	Including Mounting Bracket
Mounting	Deck or Bulkhead	

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
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 Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12

GPS200 *GPS Antenna/ Receiver*

Maretron's GPS200 is a state-of-the-art 32 channel GPS antenna and receiver capable of producing five position fixes per second. The GPS200 has unprecedented sensitivity and can even be mounted underneath a fiberglass deck. An additional benefit of the GPS200 is that it broadcasts precision magnetic variation information using the current position and world magnetic model (WMM-2010).

The GPS200 antenna/receiver is a plug-and-play device that is fully compliant and certified to the NMEA 2000® Standard. It will directly connect to any NMEA 2000® network and communicate with navigational software, chart plotters, autopilots and dedicated instrument displays – such as Maretron's DSM250 graphical display – and its compact, waterproof housing provides years of reliable performance.

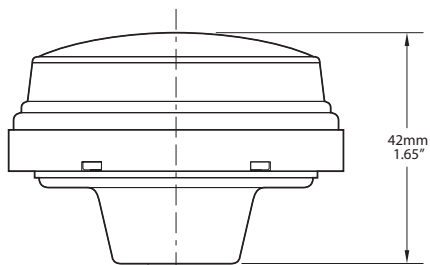


The GPS200 automatically decodes GPS correction signals from Satellite Based Augmentation Systems (SBAS) including the North American Wide Area Augmentation System (WAAS), the European Geostationary Navigation Overlay System (EGNOS), or the Asian Multifunctional Transport Satellite-based Augmentation System (MSAS) to provide better than 2.5m accuracy.

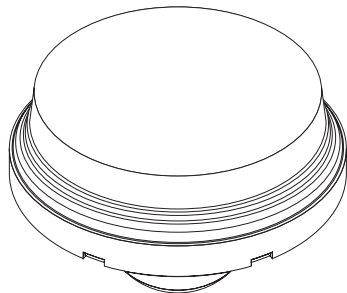
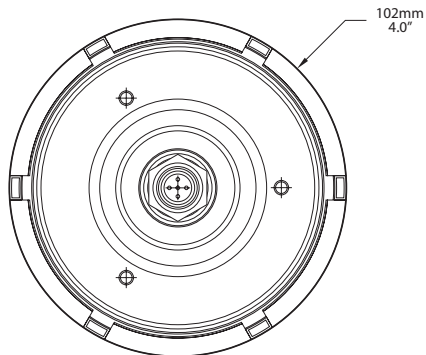
The GPS200 is easily mounted to any 1" standard marine mount with its standard 1"-14" male threads. It can also be mounted directly to a deck.

Products

PART NUMBER	DESCRIPTION
GPS200-01	GPS Antenna/Receiver



1" - 14 - UNS-2B Thread
(1" - 14TPI Standard Marine Mount)



DSM250 Screen Shots

Specifications

Parameter	Value	Comment
Position Accuracy (Autonomous)	<3m	2D RMS (95% of Data Falls Within 10m)
Position Accuracy (WAAS)	<2.5m	2D RMS (95% of Data Falls Within 3m)
Channels	32	Simultaneous Tracking of 32 Satellites
Tracking Sensitivity	-159dBm	
Position Update Rate	5 per Second	5 Hz Position Fix Calculation Rate
Speed Update Rate	4 per Second	
Time Update Rate	1 per Second	
Hot Start	1 Seconds	Start Within Hours of Last Power Down
Warm Start	33 Seconds	Start Within Days of Last Power Down
Cold Start	36 Seconds	Start from Unknown Position
Satellite Based Augmentation System	WAAS	North America
	EGNOS	Europe
	MSAS	Asia
Acceleration Limit	<4g	
Altitude Limit	<1800m	
Velocity Limit	<515 m/sec	
Jerk Limit	20 m/s ³	
Battery Backup	Lithium (4-5) days	Holds Position for Hot/Warm Starts

Certifications

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	Tested to IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers (PGNs)

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	126992	System Time	1 Time/Second
	128259	Speed	Disabled
	129025	Position, Rapid Update	5 Times/Second
	129026	COG and SOG, Rapid Update	4 Times/Second
	129029	GNSS Position Data	1 Time/Second
	129539	GNSS DOPs	1 Time/Second
	129540	GNSS Satellites in View	1 Time/Second
	127258	Magnetic Variation	1 Time/Second
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
	129538	GNSS Control Status	N/A
	129541	GPS Almanac Data	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060416	ISO Transport Protocol, Connection Management	N/A
	060160	ISO Transport Protocol, Data Transfer	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126206	NMEA Request/Command/Acknowledge	N/A

Mechanical Electrical

Parameter	Value	Comment
Operating Voltage	9 to 32 Volts	DC Voltage
Power Consumption	<100mA	Average Current Drain
Load Equivalence Number (LEN)	2	NMEA 2000® Spec. (1LEN = 50 mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Parameter	Value	Comment
Size	4" dia. x 1.65" Tall (102mm Dia. X 42mm Tall)	Not Including Antenna Mount Base
Weight	6 Oz. (.170 g)	Not Including Antenna Mount Base
Mounting	Deck or Pole	

Environmental

Parameter	Value
IEC 60954 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
Relative Humidity	93%RH @40° per IEC60945-8.2
Vibration	2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s ² 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
Electromagnet Emission	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



DST100 *Depth/Speed/ Temperature Transducer*

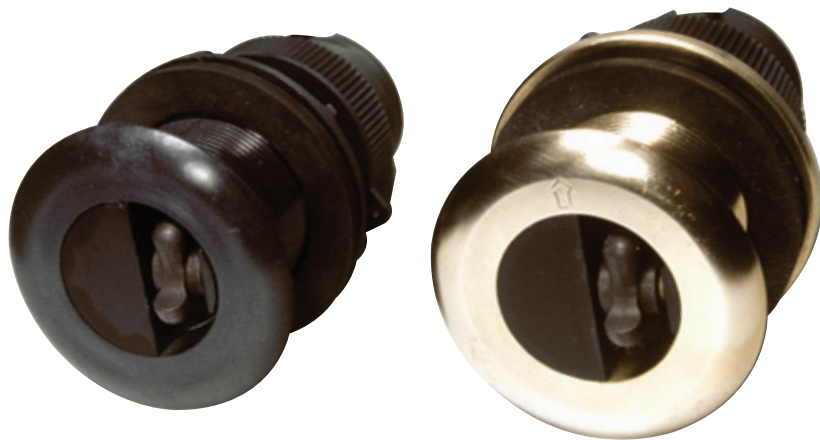
Maretron's DST100 Smart™ Retractable Depth/ Speed/Temperature Transducer, delivers precise digital depth, accurate speed and exact water temperature even at speeds above 40 knots — all with no programming or calibration necessary.

Its patented Smart™ Sensor technology, retractable and removable sensor, and NMEA 2000® network connectivity make the DST100 easy to interpret, easy to install and connect with other navigation equipment, and easy to maintain.

The DST100 measures precise water depth at 0.4m to 60m with a wide beam width and is tolerant to most deadrise angles. It reads water temperature from -10°C to +40°C at ±1.0°C accuracy, and accurate speed from 1 to 60 knots. At 235kHz it can be used with a fishfinder as an ideal navigation tool for sport or commercial fishing vessels—or with sailing vessels of all sizes.

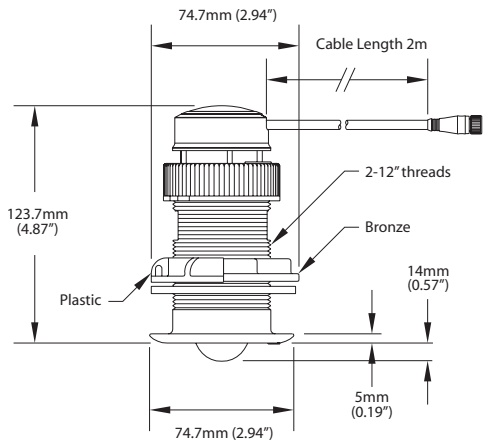
Products

PART NUMBER	DESCRIPTION
DST100-01	Depth/Speed/Temperature Triducer®
M33-100	Bronze Housing Kit for DST100
M33-495-01	Stainless Steel Housing Kit for DST100
33-398-04PW	Spare Paddle Wheel Kit



The DST100's plastic, bronze, or stainless steel housing choices are compatible with any hull material. It includes a blank plug to replace its sensor unit when the vessel will be docked for extended periods or trailered. This prevents damage to the sensor and reduces fouling growth.

Maretron's DST100 is CE compliant (IEC 60945) and is manufactured to the highest quality standards under ISO9K/2K procedures. Its compact, waterproof housing will provide years of reliable performance, making it the Smart™ choice in marine sensing.



Specifications

Parameter	Value	Comment
Depth Operating Frequency	235 kHz	Wide Beam Angle
Beam Width	10° x 44°	
Minimum Depth	0.4 meters	Deadrise Angle Tolerant
Maximum Depth	60 meters	No Calibration Required
Depth Tracking Speeds	Up to 40 knots	High Speed Bottom Tracking Capability
Depth Update Rate	1 second	
Speed Sensor	Paddlewheel	No Calibration Required
Speed Range	1 – 52 knots	Microprocessor Signal Processing Accuracy
Speed Update Rate	1 second	
Water Temperature Range	-10°C to 40°C	Fast Response Time
Water Temperature Accuracy	±1.0°C	No Calibration Required
Water Temperature Resolution	0.01°C	
Deadrise Angle	≤22°	

Certifications

Standard	Comment
NMEA 2000® Standard	Level B+
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers (PGNs)

Description	PGN#	PGN Name	Default Rate
Periodic Data PGNs	128267	Water Depth	1 Time/Second
	128259	Speed (Water Referenced)	1 Time/Second
	130310	Environmental Parameters (Water Temperature)	2 Times/Second
	128275	Distance Log	1 Time/Second
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA Request/Command/Acknowledge	N/A

Electrical

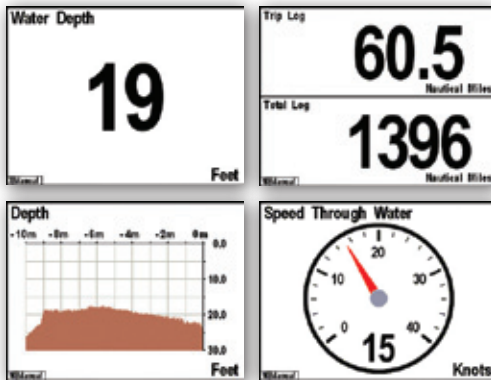
Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	DC Voltage
Power Consumption	<50mA	Average Current Drain
Load Equivalence Number (LEN)	1	NMEA 2000® Spec. (1LEN = 50 mA)
Reverse Battery Protection	Yes	Indefinitely

Mechanical

Parameter	Value	Comment
Size	2.94" Dia. X 4.87" Tall (74.7mm Dia. X 123.7mm Tall)	Including Mounting Flanges
Weight	12 Oz. (340 g)	
Mounting	Lexan/Bronze/Stainless Steel	Bronze/Stainless Steel Optional
Hole Diameter for Mounting	2" (51 mm)	

Environmental

Parameter	Value
IEC 60945 Classification	Submerged
Degree of Protection	IP68
Operating Temperature	-10°C to 40°C
Storage Temperature	-40°C to 71°C



DSM250 Screen Shots

Engine / Vessel Monitoring

- J2K100 • ACM100 • TMP100
- EMS100 • DCM100 • TLM100
- TLA100 • SIM100 • TLM150
- RAA100 • RIM100 • TLM200

Maretron brings you plug-and-play engine and vessel monitoring electronics for distributing critical data throughout the vessel. Whether you're down in the engine room or up at the fly bridge, all the information you need is available everywhere you need it.

Gone are the days of disparate systems that fail to communicate with each other. With Maretron's networked electronic components like engine and tank monitors, vessel data is combined for advanced features like fuel economy (MPG or GPM) or distance and time to empty (calculated from engine fuel rate, vessel speed from GPS, and fuel remaining from tank monitor).

Finally, true vessel monitoring on a single network combining information for display anywhere and everywhere you need it.



J2K100
J1939 to NMEA 2000® Gateway



RAA100
Rudder Angle Adapter



SIM100
Switch Indicator Module



TLM100
Tank Level Monitor (40"Depth)



EMS100
Analog Engine Monitoring System



ACM100
Alternating Current Monitor



RIM100
Run Indicator Module



TLM150
Tank Level Monitor (Gasoline)



TLA100
Tank Level Adapter



DCM100
Direct Current Monitor



TMP100
Temperature Module



TLM200
Tank Level Monitor (104"Depth)



J2K100 *J1939 to NMEA 2000® Gateway*

Maretron's J2K100 attaches directly into J1939 networks of compatible engines, transmissions, and gensets and converts the J1939 data to the new marine digital interface (NMEA 2000®). Critical engine, transmission, and genset data is then distributed throughout the vessel over a single cable where it can be monitored by any NMEA 2000® compatible display.

The J2K100 can also be used as part of a complete fuel computer. Simply connect the J2K100 together with Maretron universal displays (DSM250/N2KView®) and GPS antenna/receiver (GPS100) and you have a system capable of displaying gallons per hour and/or miles per gallon.



Products

PART NUMBER	DESCRIPTION
J2K100-01	J1939 to NMEA 2000® Gateway
MCF-2M-D4	J2K100 adapter Micro female to Deutsche 4 Pin 2 Meter Cordset
MCF-2M-D12	J2K100 adapter Micro female to Deutsche 12 Pin 2 Meter Cordset
MCF-2M-D12CAT	J2K100 adapter Micro female to Deutsche 12 Pin 2 T cable

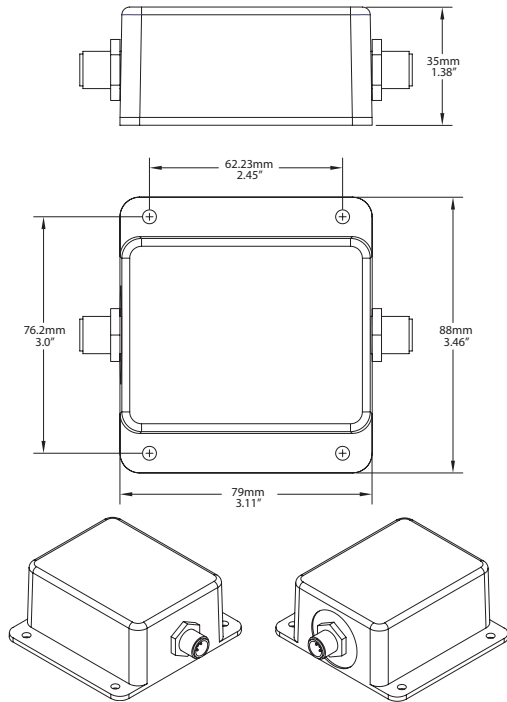
The J2K100 converts the following information:

- AC Generator Current
- AC Generator Frequency
- AC Generator Voltage
- Tachometer
- Engine Hours
- Coolant Pressure
- Coolant Water Temperature
- Engine Oil Pressure
- Engine Oil Temperature
- Boost Pressure
- Fuel Rate Monitoring
- Charging Voltage
- Percent Engine Load
- Percent Engine Torque
- Rated Engine Speed
- VIN
- Software ID
- Transmission Gear
- Transmission Oil Pressure
- Transmission Oil Temperature



The J2K100 is compatible with any engine, transmission, or genset equipped with a J1939 interface, including products from the following manufacturers:

- Caterpillar
- Cummins
- Detroit Diesel
- John Deere
- Kohler
- Northern Lights
- Onan
- Perkins
- Steyr
- Volvo Penta
- Yanmar



N2KView Engine Screen



DSM250 Screen Shots

Specifications (J1939 Data Translated to NMEA 2000® Data)

J1939 SPN/PGN	Description	NMEA 2000® PGN
190 / 61444	Engine Speed	127488
102 / 65270	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	Engine Rated Speed	127498
237 / 65260	Vehicle Identification Number	127498
234 / 65242	Software Identification	127498
523 / 61445	Transmission Current Gear	127493
127 / 65272	Transmission Oil Pressure	127493
177 / 65272	Transmission Oil Temperature	127493

Certifications

Standard	Comment
NMEA 2000® Standard	Level B+
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers (PGNs)

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	127488	Engine Parameters, Rapid Update	10 times/second
	127489	Engine Parameters, Dynamic	1 time/second
	127498	Engine Parameters, Static	N/A
	127493	Transmission Parameters, Dynamic	10 times/second
	65030	J1939 Generator Average Basic AC Quantities	10 times/second
	65226	J1939 Diagnostic Message #1	N/A
	65227	J1939 Diagnostic Message #2	N/A
	65228	J1939 Diagnostic Message #3	N/A
	65229	J1939 Diagnostic Message #4	N/A
	65230	J1939 Diagnostic Message #5	N/A
	65231	J1939 Diagnostic Message #6	N/A
	65232	J1939 Diagnostic Message #8	N/A
65234	J1939 Diagnostic Message #10	N/A	
65235	J1939 Diagnostic Message #11	N/A	
65236	J1939 Diagnostic Message #12	N/A	
Response to Request PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA Request/Command/Acknowledge	N/A
Maretron Proprietary PGNs	126720	Configuration	N/A

Environmental Mechanical Electrical

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	DC Voltage
Power Consumption	<150mA	Average Current Drain
Load Equivalence Number (LEN)	3	NMEA 2000® Spec. (1LEN = 50 mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Parameter	Value	Comment
Size	3.11" x 3.46" x 1.38" (79mm x 88mm x 35mm)	Including Flanges For Mounting
Weight	8 oz. (227 g)	

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



EMS100 *Analog Engine Monitoring System*

Maretron's EMS100 plugs directly into engine wiring harnesses and converts analog signals such as water temperature and oil pressure to the new marine digital interface (NMEA 2000®). Critical engine data is then distributed throughout the vessel over a single cable where it can be monitored by any NMEA 2000® compatible display.

The EMS100 is compatible with existing instrument panels and key switches so you don't need to remove them while upgrading to newer digital technology. For new installations, the EMS100 and a compatible NMEA 2000® display can replace the traditional analog instrument panel.



The EMS100 provides these functions:

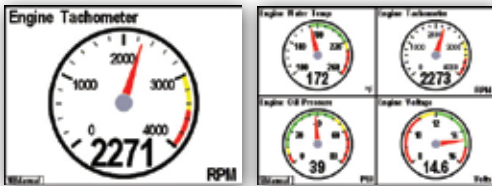
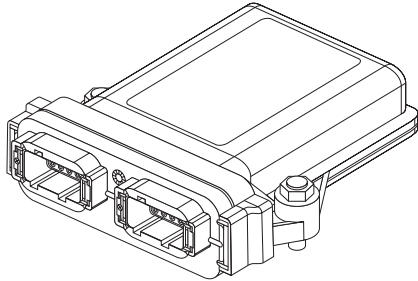
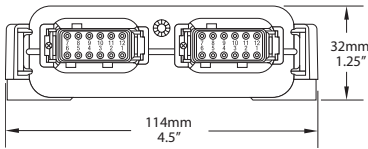
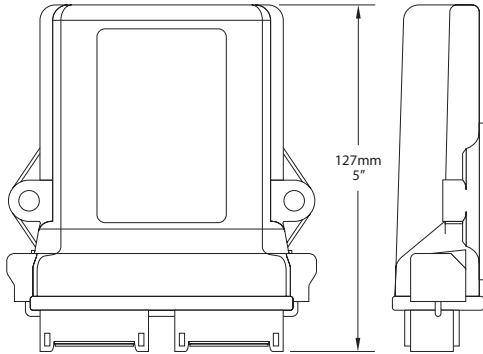
- Tachometer
- Engine Hours
- Coolant Water Temperature
- Engine Oil Pressure
- Boost Pressure
- Charging Voltage
- Drive Trim
- Fuel Filter Alarm
- Boost Alarm
- Coolant Water Level Alarm
- Engine Oil Pressure Alarm
- Exhaust (Salt Water Flow) Alarm
- Coolant Water Temperature Alarm

The EMS100 is compatible with these Yanmar engines (other engines supported soon, check our web page www.maretron.com):

- GM Series
- YM Series
- JH Series
- LH Series
- LP Series
- LY Series

Products

PART NUMBER	DESCRIPTION
EMS100-01	Analog Engine Monitoring System
EMSYMR01	Yanmar Harness



DSM250 Screen Shots

Specifications

Parameter	Type	Comment
Tachometer	Analog/Digital Input	Configurable by # of Teeth
Engine Hours	Logged with Key On	Stored Indefinitely in Non-Volatile Memory
Oil Pressure	Analog Input	Sensor Voltage Monitor/Sensitize
Coolant Water Temp	Analog Input	Sensor Voltage Monitor/Sensitize
Boost Pressure	Analog Input	Sensor Voltage Monitor/Sensitize
Drive Trim Angle	Analog Input	Sensor Voltage Monitor/Sensitize
Charging Voltage	Alarm/Switch Input	
Lube Oil Filter Alarm	Alarm/Switch Input	
Boost Pressure Alarm	Alarm/Switch Input	
Coolant Water Temperature Alarm	Alarm/Switch Input	
Oil Pressure Alarm	Alarm/Switch Input	
Exhaust (Salt Water Flow) Alarm	Alarm/Switch Input	
Clutch Oil Pressure Alarm	Alarm/Switch Input	
Diesel Preheat Alarm	Alarm/Switch Input	
Diesel Preheat Alarm	Alarm/Switch Input	

Certifications

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers (PGNs)

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	127488	Engine Parameters, Rapid Update	10 times/second
	127489	Engine Parameters, Dynamic	1 time/second
	126464	PGN List (Transmit and Receive)	N/A
Response to Request PGNs	126996	Product Information	N/A
	126998	Configuration Information	N/A
	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
Protocol PGNs	060416	ISO Transport Protocol, Connection Management	N/A
	060160	ISO Transport Protocol, Data Transfer	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA Request/Command/Acknowledge	N/A
	126720	Configuration	N/A

Electrical

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	NMEA Interface
	9 to 32 Volts	Engine Interface
Power Consumption	<150mA	From Battery
Load Equivalence Number (LEN)	1	NMEA 2000® Spec. (1LEN = 50 mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Mechanical

Parameter	Value	Comment
Size	5" x 4.5" x 1.25" (127mm x 114mm x 32mm)	Excluding Wiring Harness
Weight	12 Oz. (340 g)	Excluding Wiring Harness

Environmental

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP68
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



TLA100 Tank Level Adapter

The TLA100 is used to adapt commercially available resistive tank senders to the NMEA 2000® network. This allows you to observe tank levels anywhere on the vessel where there are NMEA 2000® compatible displays such as the Maretron DSM250.

The TLA100 is compatible with both the American standard (240-30 ohm) and the European standard (10-180 ohm) resistive senders. In fact, the TLA100 can be calibrated for any resistance between 0 and 300 ohms.

Unlike most tank senders that only work with rectangular tanks, the TLA100 can be calibrated for irregular tank shapes so you know the true level of the tanks. You can also use the TLA100 with analog gauges at the same time as NMEA 2000® so you don't have to give up existing analog gauges to enjoy the advantages of digitally networked information.

Products

PART NUMBER	DESCRIPTION
TLA100-01	Tank Level Adapter

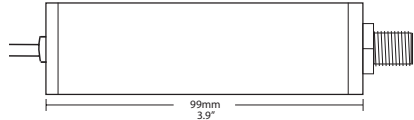


The Maretron TLA100 has the following features:

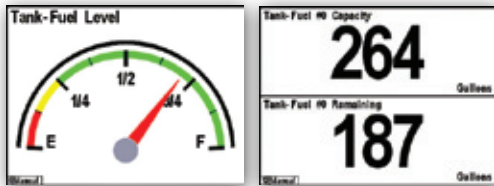
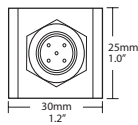
- NMEA 2000® Interface
- Adapts American standard (240-30 ohm) resistive senders to NMEA 2000® Network
- Adapts European standard (10-180 ohm) resistive senders to NMEA 2000® Network
- Calibrated for any Resistance Range from 0 to 300 Ohms or 300 to 0 Ohms
- Accommodates Irregularly Shaped Tanks with 16 Point Calibration
- 16 Programmable Tank Types Including Fuel, Fresh Water, Waste Water, Live Well
- Programmable Tank Number(s) Up to 16 per Tank Type
- Programmable Tank Capacity
- Works Alongside of Analog Gauges
- Can be Used Standalone without Analog Gauges



Side View



End View



DSM250 Screen Shots

Specifications

Parameter	Value	Comment
Accuracy	+/-2%	Does Not Include Inaccuracies of Analog Gauge or Sender
Resolution	+/-1%	Worst Case (Resolution Better at High Resistance Values)
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
American Standard Senders	240-30 ohms	Standard Sender Types are User Selectable
European Standard Senders	10-180 ohms	Standard Sender Types are User Selectable
Calibration Resistance Range	0-300 ohms	Non-Standard Sender Calibration
Support for Irregularly Shaped Tanks	Yes	Can be Calibrated for any Shape Tank
Programmable Tank Capacity	Yes	Allows Displays to Calculate Amount Remaining
Analog Gauge Support	Yes	Can be Used With or Without Analog Gauges

Certifications

Standard	Comment
NMEA 2000® Standard	Level B+
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers (PGNs)

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	127505	Fluid Level	0.4 Times/Second
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA Request/Command/Acknowledge	N/A

Electrical

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	DC Voltage
Power Consumption	<100mA	Average Current Drain
Load Equivalence Number (LEN)	2	NMEA 2000® Spec. (1LEN = 50mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Mechanical

Parameter	Value	Comment
Size	3.9" x 1.2" x 1.0" (99mm x 30mm x 25mm)	Excluding NMEA 2000® Connector & Cable
Weight	9 oz. (255g)	
Mounting	Any Orientation	

Environmental

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
Relative Humidity	93%RH @40° per IEC60945-8.2
Vibration	2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s ² 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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



RAA100 Rudder Angle Adapter

Maretron's RAA100 is used to adapt commercially available resistive rudder senders to the NMEA 2000® network. This allows you to observe rudder angle anywhere on the vessel where there are NMEA 2000® compatible displays such as the Maretron DSM250.

The RAA100 is compatible with both the American standard (240-30 ohms) and European standard (10-180 ohm) resistive senders. In fact, the RAA100 can be calibrated for any resistance between 0 and 300 ohms.

You can also use the RAA100 with analog gauges at the same time as NMEA 2000® so you don't have to give up existing analog gauges to enjoy the advantages of digitally networked information.

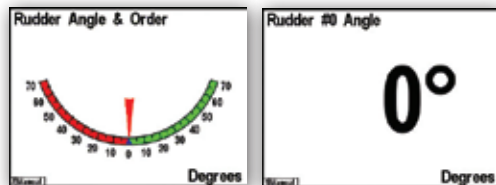
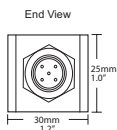
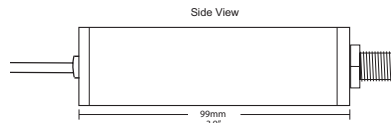
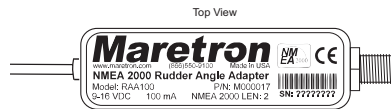


The Maretron RAA100 has the following features:

- NMEA 2000® Interface
- Adapts American standard (240-30 ohm) resistive senders to NMEA 2000® Network
- Adapts European standard (10-180 ohm) resistive senders to NMEA 2000® Network
- Can be Calibrated for any Resistive Sender Ranging from 0-300 Ohms or 300-0 Ohms
- Three Point Electronic Calibration eliminates need for Mechanical Adjustment or Calibration
- Can be Used Standalone Without Analog Gauges

Products

PART NUMBER	DESCRIPTION
RAA100-01	Rudder Angle Adapter



DSM250 Screen Shots

Specifications

Parameter	Value	Comment
Accuracy	+/-2%	Does Not Include Inaccuracies of Analog Gauge or Sender
Resolution	+/-1%	Worst Case (Resolution Better at High Resistance Values)
American Standard Senders	240-30 ohms	Standard Sender Types are User Selectable
European Standard Senders	10-180 ohms	Standard Sender Types are User Selectable
Calibration Resistance Range	0-300 ohms	Non-Standard Sender Calibration
Electronic Calibration	Yes	Eliminates need to mechanically adjust or calibrate
Analog Gauge Support	Yes	Can be Used With or Without Analog Gauges

Certifications

Standard	Comment
NMEA 2000® Standard	Level B+
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers (PGNs)

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	127254	Rudder	10 Times/Second
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA Request/Command/Acknowledge	N/A
Maretron Proprietary PGNs	126720	Configuration	N/A

Electrical

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	DC Voltage
Power Consumption	<100mA	Average Current Drain
Load Equivalence Number (LEN)	2	NMEA 2000® Spec. (1LEN = 50mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Mechanical

Parameter	Value	Comment
Size	3.9" x 1.2" x 1.0" (99mm x 30mm x 25mm)	Excluding NMEA 2000® Connector & Cable
Weight	9 oz. (255g)	
Mounting	Any Orientation	

Environmental

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



ACM100 *Alternating Current Monitor*

Maretron's ACM100 is a device which monitors AC power sources and outputs information about these sources onto the industry standard NMEA 2000® marine data network. ACM100 output information is then displayed with networked NMEA 2000® equipment such as the Maretron DSM250 dedicated display or with NMEA 2000® compatible software such as Maretron N2KView®.

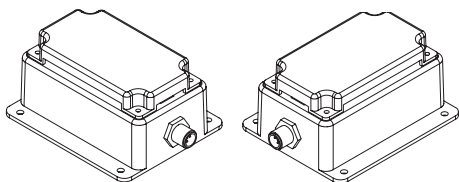
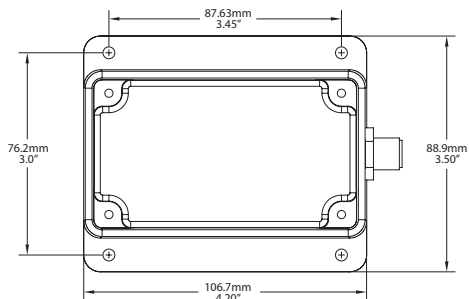
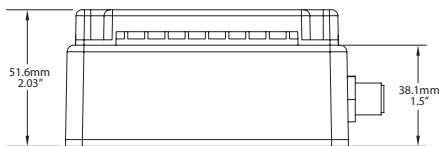


Products

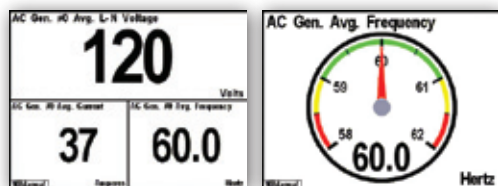
PART NUMBER	DESCRIPTION
ACM100-01 M000630	Alternating Current (AC) Monitor ACM100 Current Transducer



- NMEA 2000® Interface
- Waterproof Connectors
- Sealed Waterproof Enclosure
- Opto-Isolated from NMEA 2000® Eliminating Potential Ground Loops
- Monitoring of busses carrying AC power and transmitting:
 - Voltage
 - Frequency
- Monitoring AC Power Sources such as Utilities and Generators and transmitting:
 - Voltage
 - Current
 - Frequency
 - Real Power
 - Reactive Power
 - Apparent Power
 - Power Factor
 - Total Energy Imported
 - Total Energy Exported



N2KView Screen



DSM250 Screen Shots

Specifications

Parameter	Value	Comment
Measurement Voltage Range	0 to 240VAC	AC Voltage
Measurement Voltage Accuracy	± 1%	0 to 240 VAC
Measurement Current Range	0 to 200A	With included current transformer
Measurement Current Accuracy	± 1%	With included current transformer

Certifications

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers (PGNs)

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	65001	Bus #1 Phase C Basic AC Quantities	10 times/second
	65002	Bus #1 Phase B Basic AC Quantities	10 times/second
	65003	Bus #1 Phase A Basic AC Quantities	10 times/second
	65004	Bus #1 Average Basic AC Quantities	10 times/second
	65005	Utility Total AC Energy	10 times/second
	65006	Utility Phase C AC Reactive Power	10 times/second
	65007	Utility Phase C AC Power	10 times/second
	65008	Utility Phase C AC Basic Quantities	10 times/second
	65009	Utility Phase B AC Reactive Power	10 times/second
	65010	Utility Phase B AC Power	10 times/second
	65011	Utility Phase B AC Basic Quantities	10 times/second
	65012	Utility Phase A AC Reactive Power	10 times/second
	65013	Utility Phase A AC Power	10 times/second
	65014	Utility Phase A AC Basic Quantities	10 times/second
	65015	Utility Total AC Reactive Power	10 times/second
	65016	Utility Total AC Power	10 times/second
	65017	Utility Average Basic AC Quantities	10 times/second
	65018	Generator Total AC Energy	10 times/second
	65019	Generator Phase C AC Reactive Power	10 times/second
	65020	Generator Phase C AC Power	10 times/second
	65021	Generator Phase C AC Basic Quantities	10 times/second
	65022	Generator Phase B AC Reactive Power	10 times/second
	65023	Generator Phase B AC Power	10 times/second
	65024	Generator Phase B AC Basic Quantities	10 times/second
	65025	Generator Phase A AC Reactive Power	10 times/second
	65026	Generator Phase A AC Power	10 times/second
	65027	Generator Phase A AC Basic Quantities	10 times/second
	65028	Generator Total AC Reactive Power	10 times/second
	65029	Generator Total AC Power	10 times/second
	65030	Generator Average Basic AC Quantities	10 times/second
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA	N/A
Maretron Proprietary PGNs	128720	Configuration	N/A

Parameter	Value	Comment
Operating Voltage	9 to 32 Volts	DC Voltage
Power Consumption	100 mA	NMEA 2000@v Interface
Load Equivalence Number (LEN)	2	NMEA 2000® Spec. (1LEN = 50 mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Parameter	Value	Comment
Size	3.50" x 4.20" x 2.03" (88.9mm x 106.7mm x 51.6mm)	Excluding NMEA 2000® Connector & Cable
Weight	13 oz. (368.5 g)	

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP64
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
Relative Humidity	93%RH @40° per IEC60945-8.2
Vibration	2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s² per IEC 60945-8.7
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



Copyright 2009 Maretron, LLP. All rights reserved. As Maretron is constantly improving its products, all specifications are subject to change without notice. Maretron's products are designed to be accurate and reliable; however, they should be used only as aids to navigation and vessel monitoring, and not as a replacement for traditional navigation and vessel monitoring techniques. A prudent captain or navigator never relies on a single source for navigation or system monitoring information. "NMEA 2000" is a registered trademark of the National Marine Electronics Association.

DCM100 *Direct Current Monitor*

Maretron's DCM100 Monitor is an advanced electronic monitoring device used to measure the voltage and current of any direct current (DC) power source or load. Examples of DC power sources that can be monitored with the DCM100 include batteries, alternators, solar panels, and wind generators. The DCM100 can also be used to monitor DC loads like inverters, windlasses, DC refrigerators, or any DC branch circuit. When the DCM100 is used to monitor batteries, sophisticated circuitry and software algorithms monitor battery temperature, load current, charging current and terminal voltage to precisely compute battery state of charge, state of health, and time remaining. To measure current, the DCM100 uses an included state-of-the-art Hall effect current sensor which simply slips over the wire – you don't have to break connections or install connectors as you do with inline shunts used by other solutions. Best of all, the DCM100 is NMEA 2000® certified so you can view any and all DC information anywhere on the vessel using a compatible NMEA 2000® display. The DCM100 is a key component of Maretron's N2KView® vessel monitoring and control system.

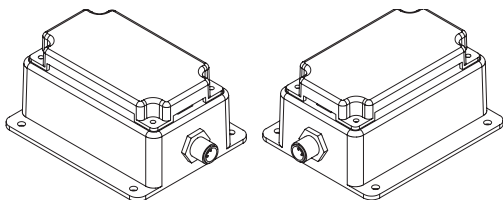
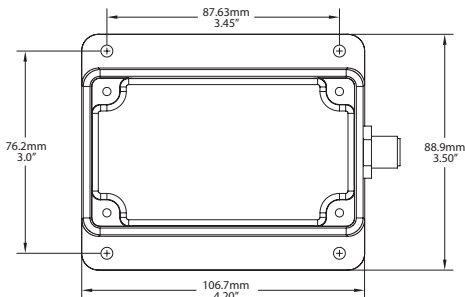
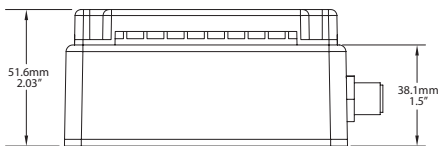


- Battery Voltage
- Battery Current
- Ripple Voltage
- Battery Case Temperature
- State of Charge
- Time Remaining
- Charge Efficiency Factor

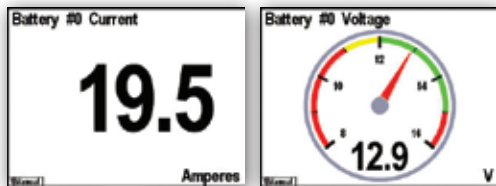
Products

PART NUMBER	DESCRIPTION
DCM100-01	Direct Current (DC) Monitor
FC01	DCM100 Battery Harness with Fuse
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





N2KView Systems Screen



DSM250 Screen Shots

Certifications Specifications

Parameter	Value	Comment
Battery Sense Voltage Range	0 to 50 VDC	
Battery Sense Voltage Accuracy	±100 mV	
Battery Current Range	0 to 200A	With included Hall-effect current sensor
Battery Current Accuracy	±1%	With included Hall-effect current sensor

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers

Description	PGN#	PGN Name	Default Rate
Periodic Data PGNs	127506	DC Detailed Status	0.67 times/second
	127508	Battery Status	0.67 times/second
	127513	Battery Configuration Status	N/A
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA	N/A
Maretron Proprietary PGNs	128720	Configuration	N/A

Mechanical Electrical

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	NMEA Interface
	9 to 32 Volts	Battery Interface
Power Consumption	70mA, 30mA	V_{PWR+} , V_{PWR-} NMEA 2000 Interface
Load Equivalence Number (LEN)	1	NMEA 2000® Spec. (1 LEN = 50mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated Per SAE J1113

Environmental

Parameter	Value	Comment
Size	3.50" x 4.20" x 2.03" (88.9mm x 106.7mm x 51.6mm)	Including Flanges for Mounting
Weight	13 oz. (368.5 g)	

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP64
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
Relative Humidity	93%RH @40° per IEC60945-8.2
Vibration	2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s ² 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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



SIM100 *Switch Indicator Module*

Maretron's Switch Indicator Module monitors switch closure devices including, but not limited to, safety equipment (e.g., heat, smoke, carbon monoxide, explosive vapor detectors), security systems (e.g., motion, vibration, glass break, door and port hole magnetic switches), and vessel monitoring equipment (e.g., valve closed/open, high water bilge). The SIM100 continually monitors these switch closure devices and broadcasts information over the NMEA 2000® network about the switch state so the crew can be alerted to potential conditions or problems that warrant further investigation. Advanced features of the SIM100 include the ability to detect whether or not power has been disconnected from the monitored device or if the signal wires have been disconnected due to either corrosion, tampering, or for any other reason (if the monitored device is so equipped). With the SIM100, you can rest assured that critical sensors are receiving power, signal wires are connected, and all the safety, security and vessel functions are under constant supervision.

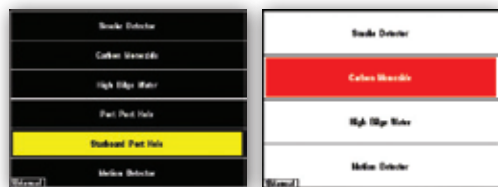
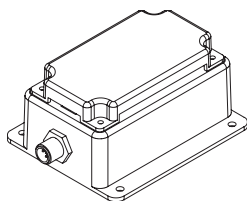
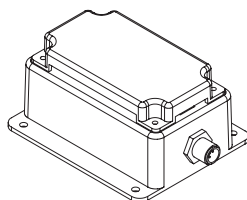
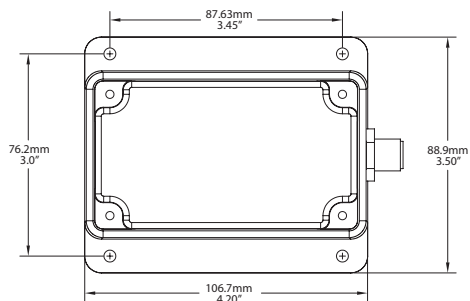
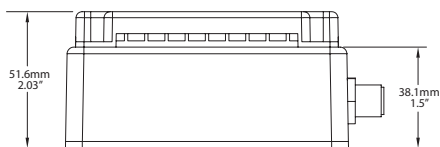


- Monitors and reports switch status
- Can detect and report problems like opens and shorts in switch circuits
- Compatible with Maretron Supplied
 - Heat Detectors
 - Smoke Detectors
 - Carbon Monoxide Detectors
 - Bilge Water Detectors
- Also Compatible With
 - Magnetic Switches
 - Glass Break Detectors
 - Door, Hatch, and Porthole Magnetic Switches

Products

PART NUMBER	DESCRIPTION
SIM100-01	Switch Indicator Module
SH-449CSTE	Smoke/Heat Detector
CO1000-S-W	Carbon Monoxide (CO) Detector (Surface Mount White)
LP1000-S-W	Liquid Petroleum (LP) Detector (Surface Mount White)
BHW100	Bilge High Water Detector
MD-6157-N	Motion Detector
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)





DSM250 Screen Shots

Specifications

Certifications

NMEA 2000® Parameter Group Numbers

Electrical

Mechanical

Environmental

Parameter	Value	Comment
End of Line Resistor	8 KΩ ± 5%	Included with Maretron-supplied sensors

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	127501	Binary Switch Bank Status	1 time/15 seconds and on switch change
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA Request/Command/Acknowledge	N/A
Maretron Proprietary PGNs	126720	Configuration	N/A

Parameter	Value	Comment
Operating Voltage	9 to 32 Volts	DC Voltage
Power Consumption	100 mA	NMEA 2000® Interface
Load Equivalence Number (LEN)	2	NMEA 2000® Spec. (1LEN = 50 mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Parameter	Value	Comment
Size	3.50" x 4.20" x 2.03" (88.9mm x 106.7mm x 51.6mm)	Including Flanges for Mounting
Weight	13 oz. (368.5 g)	

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP64
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
Relative Humidity	93%RH @40° per IEC60945-8.2
Vibration	2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s² per IEC 60945-8.7
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12

RIM100 *Run Indicator Module*

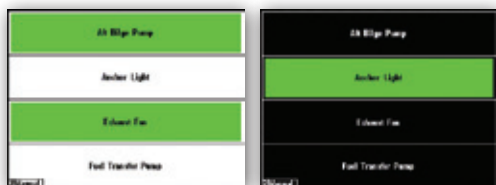
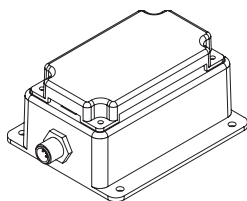
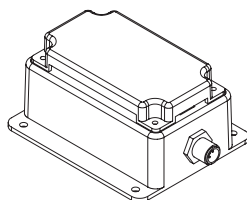
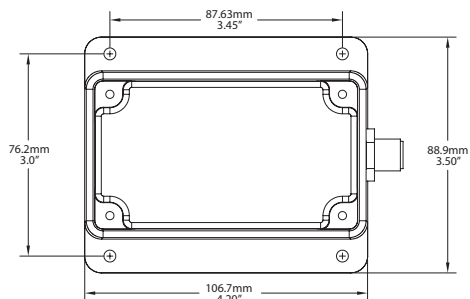
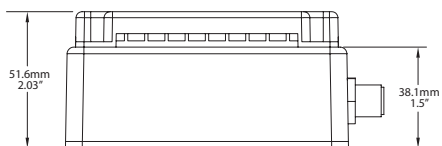
Maretron's Run Indicator Module monitors both AC and DC electrical circuits and reports, over an NMEA 2000 network, whether or not the electrical circuit is energized and running. The RIM100 works equally as well for monitoring manually switched loads (e.g., running lights, anchor lights, or deck lights) as it does for automatically switched loads. Monitoring automatically switched loads (e.g., bilge pumps, engine exhaust/intake fans, and transfer pumps) via the RIM100 is especially useful because you know exactly when equipment is, or isn't running.



- Monitors and reports the running status of connected devices
- Works with both AC and DC loads
- Works with both automatically and manually switched loads
- Can indicate the status of a wide variety of loads
 - Bilge Pumps
 - Winches
 - Running Lights
 - Transfer Pumps
 - Exhaust/Intake Fans

Products

PART NUMBER	DESCRIPTION
RIM100-01	Run Indicator Module



DSM250 Screen Shots

Specifications
Certifications
NMEA 2000® Parameter Group Numbers

Parameter	Value	Comment
"ON" Voltage Range (DC)	9VDC to 240VDC	
"ON" Voltage Range (AC)	9VAC to 240VAC	RMS

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	127501	Binary Switch Bank Status	1 time/15 seconds and on switch change
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA Request/Command/Acknowledge	N/A
Maretron Proprietary PGNs	128720	Configuration	N/A

Parameter	Value	Comment
Operating Voltage	9 to 32 Volts	DC Voltage
Power Consumption	100 mA	NMEA 2000® Interface
Load Equivalence Number (LEN)	2	NMEA 2000® Spec. (1LEN = 50 mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Parameter	Value	Comment
Size	3.50" x 4.20" x 2.03" (88.9mm x 106.7mm x 51.6mm)	Including Flanges for Mounting
Weight	13 oz. (368.5 g)	

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP64
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
Relative Humidity	93%RH @40° per IEC60945-8.2
Vibration	2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s² per IEC 60945-8.7
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12

Electrical

Mechanical

Environmental

TMP100 *Temperature Module*

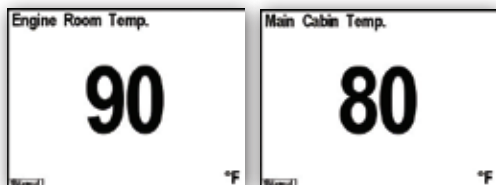
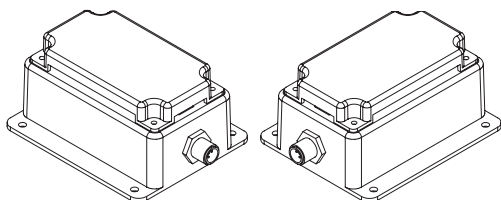
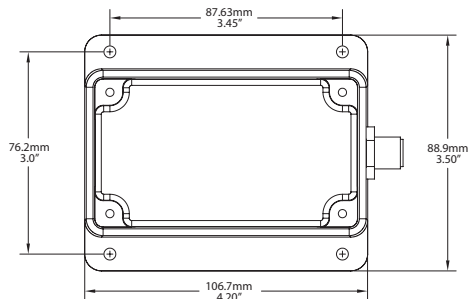
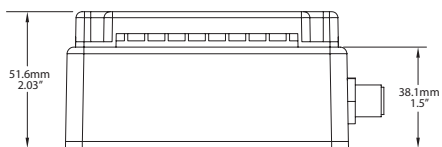
Maretron's TMP100 measures the temperature for up to 6 temperature probes and reports the information over an NMEA 2000® network. The TMP100 supports up to 4 thermistor probes and 2 high temperature thermocouple probes. Optional thermistor probes (-20°C to 80°C or -4°F to 176°F) cover a wide range of applications including cabin air temperature, engine room air temperature, refrigerator/freezer temperature, under bolt temperature (inverters, charges, pumps, motors, etc.), tank temperatures (live well bait, hot water, etc.), and air duct temperatures. The optional thermocouple probes (0°C to 900°C or 32° to 1652°F) are used to measure Exhaust Gas Temperature (EGT) as part of a comprehensive fuel management system.



Products

PART NUMBER	DESCRIPTION
TMP100-01	Temperature Module
TR3K	TMP100 Ring/Under Bolt Temperature Probe
TP-AAP-1	TMP100 Ambient Air Temperature Probe
TP-IP-1	TMP100 Immersion (Tanks, Plenums, etc.) Temperature Probe
TP-EGT-1	TMP100 Exhaust Gas Temperature (EGT) Probe

- Six External Temperature Probes are Measured and Broadcast Over NMEA 2000 Network
- Four Channels for Thermistor Probes and 2 Channels for High Temperature Thermocouple Probes
- Wide Variety of Applications Supported with Optional Temperature Probes
 - Cabin Temperature
 - Engine Room Temperature
 - Under Bolt Temperature (Inverters, Chargers, Pumps, etc.)
 - Refrigerator/Freezer Temperature
 - Tank Temperatures (Live Well Bait, Hot Water, etc.)
 - Air Duct Temperature
 - Exhaust Gas Temperature
- Optional Temperature Probes
 - Ambient Air Temperature Probe (-20°C to 80°C or -4°F to 176°F)
 - Ring Terminal Probe (-20°C to 80°C or -4°F to 176°F)
 - Immersion Probe for Tanks or Plenums (-20°C to 80°C or -4°F to 176°F)
 - Exhaust Gas Temperature Probe (0°C to 900°C or 32° to 1652°F)



DSM250 Screen Shots

Specifications

Parameter	Value	Comment
Measurement Range – Thermistor	-20°C to 80°C (-4°F to 176°F)	With supplied thermistor probe
Measurement Accuracy – Thermistor	± 2°C (± 3.6°F)	With supplied thermistor probe
Measurement Range – Thermocouple	+0°C to 700°C (32°F to 1292°F)	With supplied thermocouple probe
Measurement Accuracy – Thermocouple	± 2°C (± 3.6°F)	With supplied thermocouple probe

Certifications

Standard	Comment
NMEA 2000® Standard	Level A
Maritime Navigation and Radio Communication Equipment & Systems	IEC 61162-3
Maritime Navigation and Radio Communication Equipment & Systems	IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers

Description	PGN #	PGN Name	Default Rate		
Periodic Data PGNs	127501	Temperature Sources: Sea Temperature Outside Temperature Inside Temperature Engine Room Temperature Main Cabin Temperature Live Well Temperature Bait Well Temperature Refrigeration Temperature Heating System Temperature Freezer Temperature	0.5 times/second		
		Response to Requested PGNs	126464 PGN List (Transmit and Receive)	N/A	
			126996 Product Information	N/A	
			126998 Configuration Information	N/A	
		Protocol PGNs		059392 ISO Acknowledge	N/A
				059904 ISO Request	N/A
				060928 ISO Address Claim	N/A
				065240 ISO Address Command	N/A
				126208 NMEA	N/A
		Maretron Proprietary PGNs	128720	Configuration Exhaust Gas Temperature	N/A 0.5 times/second

Electrical

Parameter	Value	Comment
Operating Voltage	9 to 32 Volts	DC Voltage
Power Consumption	100 mA	NMEA 2000® Interface
Load Equivalence Number (LEN)	2	NMEA 2000® Spec. (1LEN = 50 mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Mechanical

Parameter	Value	Comment
Size	3.50" x 4.20" x 2.03" (89.9mm x 106.7mm x 51.6mm)	Including Flanges for Mounting
Weight	13 oz. (368.5 g)	

Environmental

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP64
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
Relative Humidity	93%RH @40° per IEC60945-8.2
Vibration	2-13.2Hz @ ±1mm, 13.2-100Hz @ 7m/s² per IEC 60945-8.7
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12



TLM100 Tank Level Monitor (40" Depth)

Maretron's TLM100 is used to sense fluid levels of tanks by using ultrasonic technology. Ultrasonic, or sound waves, are transmitted via the TLM100 mounted at the top of the tank and the flight times of the sound waves to and from the fluid are measured much like a depth sensor. What this means for you is that there are no difficult to handle long probes protruding into the tank, which often foul and/or corrode. Once the TLM100 calculates and transmits the fluid level over the NMEA 2000® network, you can observe tank levels anywhere on the vessel where there is an NMEA 2000® compatible display such as the Maretron DSM250.

The TLM100 is capable of sensing fluid levels in tanks up to 40" (1.02m) in depth. It can be used for diesel, fresh water, waste water, black water, and oil tanks (see TLM150 for gasoline tanks or TLM200 for deeper tanks). Unlike most tank senders that only work with rectangular tanks, the TLM100 can be calibrated for irregular tank shapes so you can know the true fluid level in your tanks.

The TLM100 is mounted directly to the top of tanks using the industry standard SAE J1810 5-hole mounting pattern.

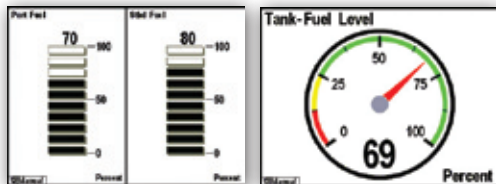
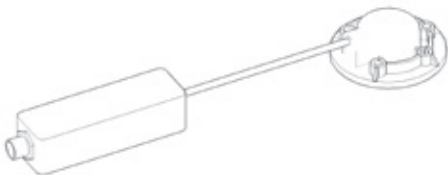
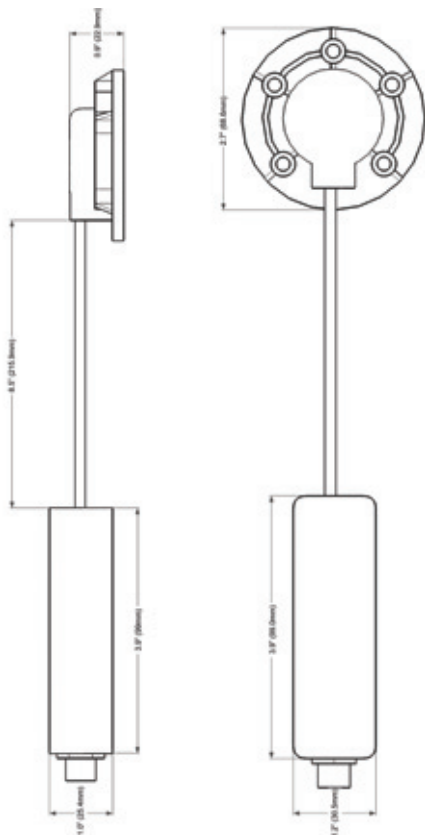


The TLM100 can also be mounted to tanks with threaded tank openings using optional adapters that included both a 1.5" NPT and a 1.25" BSP adapter. There are other important TLM100 optional accessories including an airlock for black water applications, which keeps the face of the ultrasonic transmitter from fouling and an optional focus tube to permit use on boats with planing hulls, which is required if the vessel spends a significant amount of time with the bow pitched up.

Most importantly, the TLM100 is NMEA 2000® certified so you can view any and all tank levels anywhere on the vessel when using a compatible NMEA 2000® display. The TLM100 is another key component of Maretron's N2KView® vessel monitoring and control system.

Products

PART NUMBER	DESCRIPTION
TLM100-01	Tank Level Monitor (40" Depth Tanks)
TA-5H-1.25BSP	1.25" BSP Displacement Hull Tank Adapter
TA-5H-1.5NPT	1.5" NPT Displacement Hull Tank Adapter
TAL-5H	SAE 5-Bolt Pattern Black Water Airlock
TAL-1.25BSP	1.25" BSP Black Water Airlock
TAL-1.5NPT	1.5" NPT Black Water Airlock
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



DSM250 Screen Shots

Specifications
Certifications
NMEA 2000® Parameter Group Numbers (PGNs)

Parameter	Value	Comment
Accuracy	+/-2%	
Resolution	+/-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" (1.02m)	
Minimum Depth Reading	2" (5.08cm)	Sensor Deadband
Support for 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

Standard	Comment
NMEA 2000	Level B
Maritime Navigation and Radio Communication Equipment & Systems	Tested to IEC 60945
FCC and CE mark	Electromagnetic Compatibility

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	127505	Fluid Level	0.4 times/second
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA	N/A

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	DC Voltage
Power Consumption	<100mA	Average Current Drain
Load Equivalence Number (LEN)	2	NMEA 2000® Spec. (1LEN = 50mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Parameter	Value	Comment
Size	3.9" x 1.2" x 1.0" (99mm x 30.5mm x 25.4mm)	Interface Component
	2.7" dia. X 0.9" (68.6mm dia. x 22.9mm)	Sensor Component
	8.5" (215.9mm)	Interconnecting Cable
Weight	12 oz. (340g)	
Mounting	SAE J1810 5-hole bolt pattern	Can mount to 1.25" BSP or 1.5" NPT using available adapters

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12

Environmental



TLM150 *Tank Level Monitor (Gasoline)*

Maretron's TLM150 is used to sense gasoline fluid levels of tanks using ultrasonic technology. Ultrasonic, or sound waves, are transmitted via the TLM150 mounted at the top of the tank and the flight times of the sound waves to and from the fluid are measured much like a depth sensor. What this means for you is that there are no difficult to handle long probes protruding into the tank, which often foul and/or corrode. Once the TLM150 calculates and broadcast the fluid level over the NMEA 2000® network, you can observe tank levels anywhere on the vessel where there is an NMEA 2000® compatible display such as the Maretron DSM250.

The TLM150 is capable of sensing gasoline levels in tanks up to 24" (0.61m) in depth (see TLM100 for fluid types other than gasoline in tanks up to 40" or the TLM200 for tanks up to 104"). Unlike most tank senders that only work with rectangular tanks, the TLM150 can be calibrated for irregular tank shapes so you can know the true fluid level in your tanks.

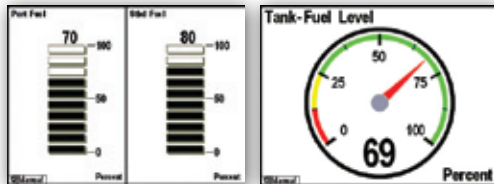
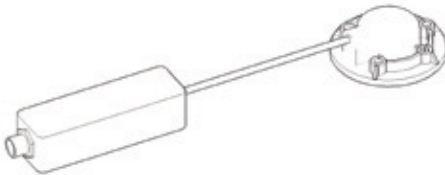
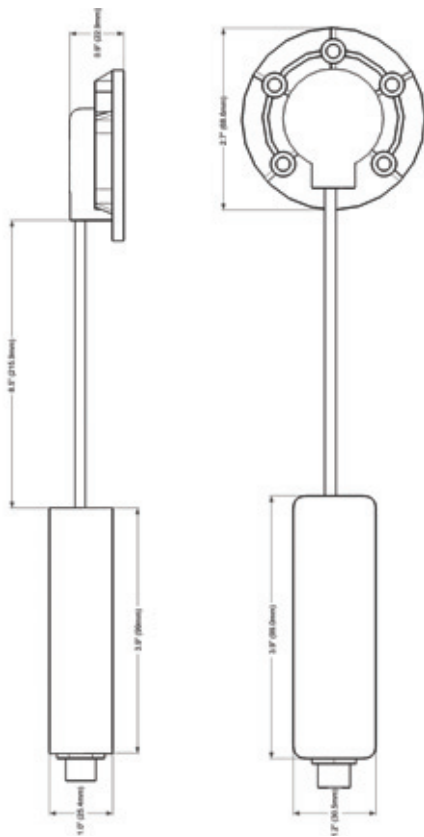


The TLM150 is mounted directly to the top of tanks using the industry standard SAE J1810 5-hole mounting pattern. The TLM150 can also be mounted to tanks with threaded tank openings using optional adapters that include both a 1.5" NPT and a 1.25" BSP adapter. The other important optional accessory for the TLM150 is the focus tube to permit use on boats with planing hulls, which is required if the vessel spends a significant amount of time with the bow pitched up.

Most importantly, the TLM150 is NMEA 2000® certified so you can view any and all tank levels anywhere on the vessel when using a compatible NMEA 2000® display. The TLM100 is another key component of Maretron's N2KView® vessel monitoring and control system.

Products

PART NUMBER	DESCRIPTION
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



DSM250 Screen Shots

Specifications

Parameter	Value	Comment
Accuracy	+/-2%	
Resolution	+/-1%	
Number of Tank Types	1	Fuel (Gasoline only)
Number of Tanks per Tank Type	16	16 Tanks per Tank Type Numbered 0-15
Maximum Tank Depth	24" (.61m)	
Minimum Depth Reading	2" (5.08cm)	Sensor Deadband
Support for 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

Certifications

Standard	Comment
NMEA 2000	Level B
Maritime Navigation and Radio Communication Equipment & Systems	Tested to IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers (PGNs)

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	127505	Fluid Level	0.4 times/second
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA	N/A

Electrical

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	DC Voltage
Power Consumption	<100mA	Average Current Drain
Load Equivalence Number (LEN)	2	NMEA 2000® Spec. (1LEN = 50mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Mechanical

Parameter	Value	Comment
Size	3.9" x 1.2" x 1.0" (99mm x 30.5mm x 25.4mm)	Interface Component
	2.7" dia. X 0.9" (68.6mm dia. x 22.9mm)	Sensor Component
	8.5" (215.9mm)	Interconnecting Cable
Weight	12 oz. (340g)	
Mounting	SAE J1810 5-hole bolt pattern	Can mount to 1.25" BSP or 1.5" NPT using available adapters

Environmental

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12

TLM200 Tank Level Monitor (104" Depth)

Maretron's TLM200 is used to sense fluid levels of tanks using ultrasonic technology. Ultrasonic, or sound waves, are transmitted via the TLM200 mounted at the top of the tank and the flight times of the sound waves to and from the fluid are measured much like a depth sensor. What this means for you is that there are no difficult to handle long probes protruding into the tank, which often foul and/or corrode. Once the TLM200 calculates and broadcast the fluid level over the NMEA 2000® network, you can observe tank levels anywhere on the vessel where there is an NMEA 2000® compatible display such as the Maretron DSM250.

The TLM200 is capable of sensing fluid levels in tanks up to 104" (2.64m) in depth. It can be used for diesel, fresh water, waste water, black water, and oil tanks (see the TLM100 for a lower cost solution for tanks up to 40" and the TLM150 for gasoline tanks). Unlike most tank senders that only work with rectangular tanks, the TLM200 can be calibrated for irregular tank shapes so you can know the true fluid level in your tanks.

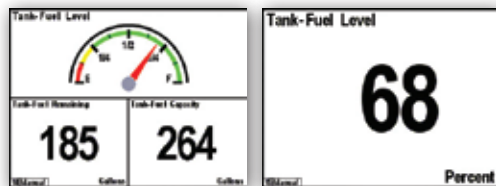
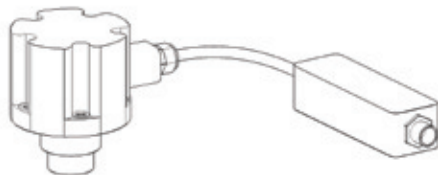
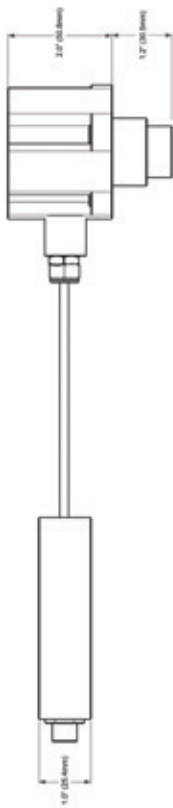


The TLM200 is mounted directly to the top of tanks using the industry standard SAE J1810 5-hole mounting pattern. The TLM200 can also be mounted to tanks with threaded tank openings using optional adapters that include both a 1.5" NPT and a 1.25" BSP adapter.

Most importantly, the TLM200 is NMEA 2000® certified so you can view any and all tank levels anywhere on the vessel when using a compatible NMEA 2000® display. The TLM100 is another key component of Maretron's N2KView® vessel monitoring and control system.

Products

PART NUMBER	DESCRIPTION
TLM200-01	Tank Level Monitor (104" Depth Tanks)
TA-5H-1.25BSP	1.25" BSP Displacement Hull Tank Adapter
TA-5H-1.5NPT	1.5" NPT Displacement Hull Tank Adapter



DSM250 Screen Shots

Parameter	Value	Comment
Accuracy	+/-2%	
Resolution	+/-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	104" (2.64m)	
Minimum Depth Reading	6" (15.24cm)	Sensor Deadband
Support for 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°	

Standard	Comment
NMEA 2000	Level B
Maritime Navigation and Radio Communication Equipment & Systems	Tested to IEC 60945
FCC and CE mark	Electromagnetic Compatibility

NMEA 2000® Parameter Group Numbers (PGNs)

Description	PGN #	PGN Name	Default Rate
Periodic Data PGNs	127505	Fluid Level	0.4 times/second
Response to Requested PGNs	126464	PGN List (Transmit and Receive)	N/A
	126996	Product Information	N/A
	126998	Configuration Information	N/A
Protocol PGNs	059392	ISO Acknowledge	N/A
	059904	ISO Request	N/A
	060928	ISO Address Claim	N/A
	065240	ISO Address Command	N/A
	126208	NMEA	N/A

Parameter	Value	Comment
Operating Voltage	9 to 16 Volts	DC Voltage
Power Consumption	<100mA	Average Current Drain
Load Equivalence Number (LEN)	2	NMEA 2000® Spec. (1LEN = 50mA)
Reverse Battery Protection	Yes	Indefinitely
Load Dump Protection	Yes	Energy Rated per SAE J1113

Parameter	Value	Comment
Size	3.9" x 1.2" x 1.0" (99mm x 30.5mm x 25.4mm)	Interface Component
	2.6" dia. X 2.0" (66.0mm dia. x 50.8mm)	Sensor Component
	96" (2.44mm)	Interconnecting Cable
Weight	15 oz. (425g)	
Mounting	SAE J1810 5-hole bolt pattern	Can mount to 1.25" BSP or 1.5" NPT using available adapters

Parameter	Value
IEC 60945 Classification	Exposed
Degree of Protection	IP67
Operating Temperature	-25°C to 55°C
Storage Temperature	-40°C to 70°C
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	Conducted and Radiated Emission per IEC 60945-9
Electromagnetic Immunity	Conducted, Radiated, Supply, and ESD per IEC 60945-10
Safety Precautions	Dangerous Voltage, Electromagnetic Radio Frequency per IEC 60945-12

Maretron NMEA 2000®

Cables & Connectors

About NMEA 2000® Cables and Connectors

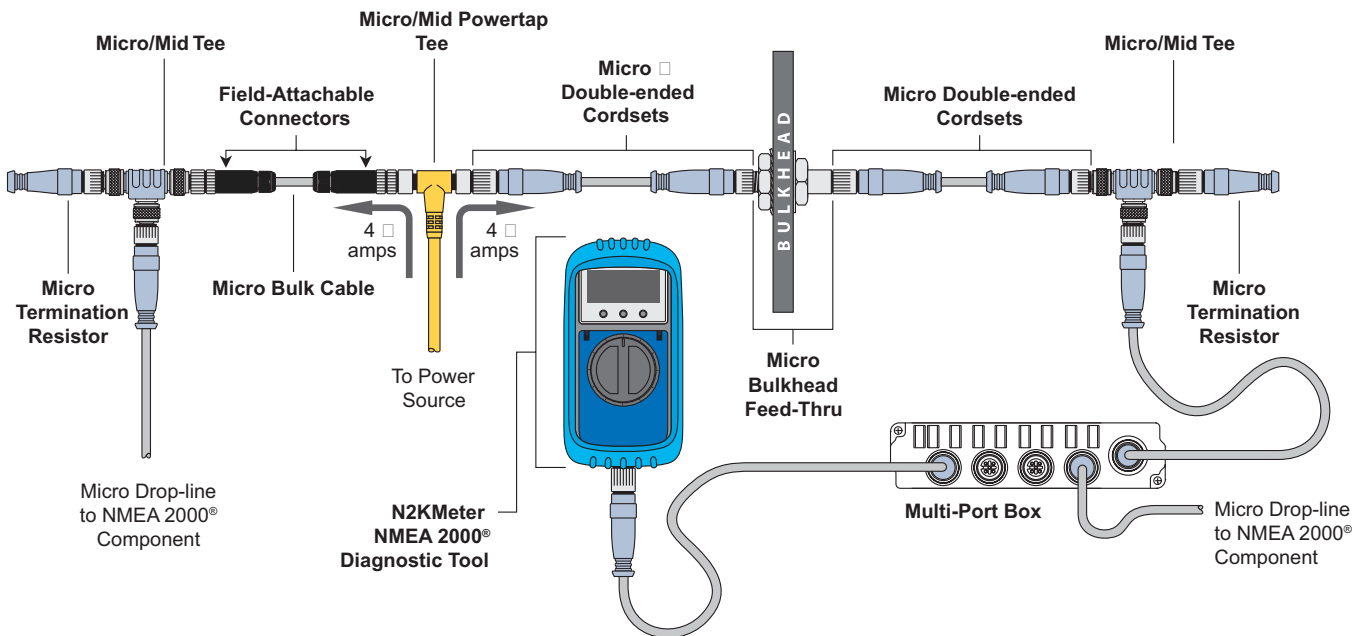
The NMEA 2000® standard goes beyond defining message content and includes requirements for the cabling used to interconnect electronic components (referred to as the physical interface). The following catalog pages contain the NMEA 2000® approved network interconnect components used to build an operational network.

About Micro, Mid and Mini Cable Systems

There are three types of NMEA 2000® cabling systems, Micro, Mid and Mini. The Micro/Mid cable system is generally used for smaller networks requiring less power (i.e., less than 4 amps per network leg) while the Mini cable system is used for larger networks (i.e., more than 4 amps but less than 8 amps per leg).

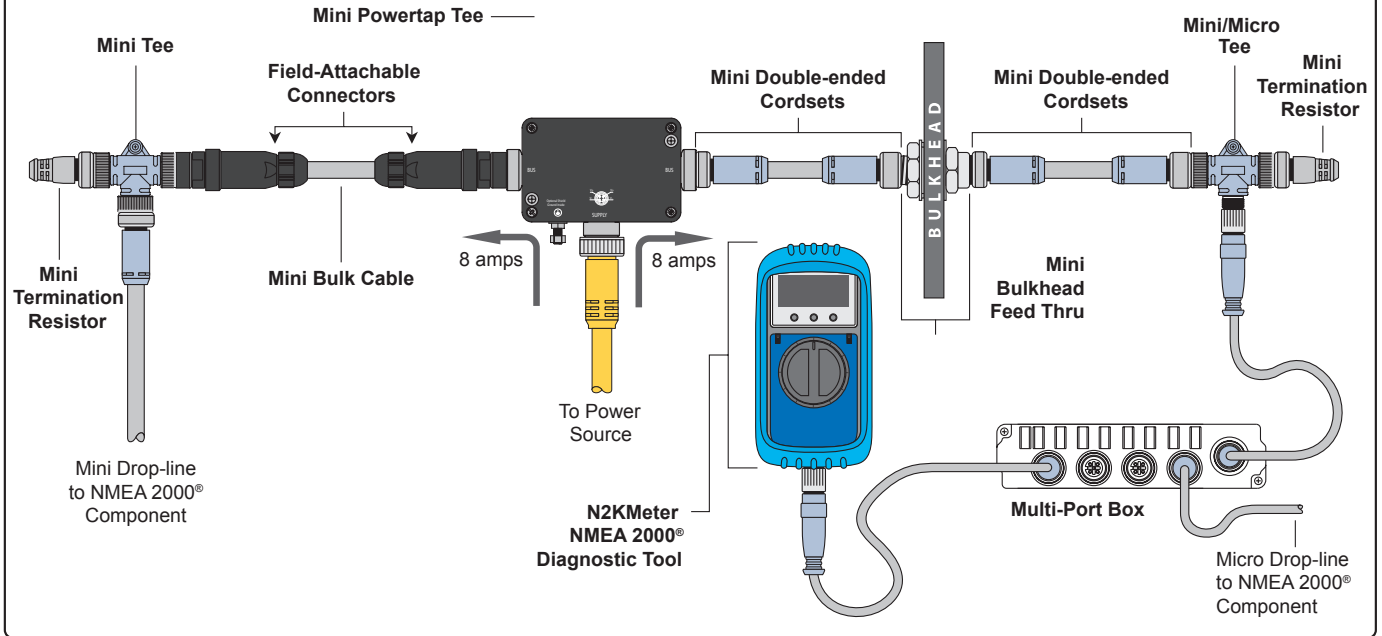
Micro/Mid NMEA 2000® Network Example

(Up to 4 amps per leg)



Mini NMEA 2000® Network Example

(Up to 8 amps per leg)



Maretron NMEA 2000® Cable Features

- Simple trunk and drop line topology interconnects all NMEA 2000® equipment
- Drop line topology allows powered component removal or re-connection while rest of network remains operational
- Cable includes power and ground for powering equipment drawing less than 1 amp/device
- Connectors include keys and keyways for 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 system from external noise sources such as high power radio transmitters and radar units
- Nickel plated brass connector ends ideally suited to harsh marine environment
- Phosphor bronze contact base material with gold over nickel plate for reliable connections
- Overmolded cable connector ends provide strain relief
- Simple easy to use diagnostic components enable trained and untrained personnel to diagnose and troubleshoot network installations

Micro Bulk Cable



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
- Used with field-attachable connectors to build exact length cables at the job site

Micro/Mid Field-Attachable Connectors (Straight – Male/Female)



Field-attachable connectors allow you to make field connections to bulk cable (see diagram). The color-coded screw terminals match the individual wire colors found within the bulk cable for error-free field installation.

- Color-coded screw terminals make for error-free field installation
- Rugged housing material designed to withstand harsh marine environments

Micro/Mid Field-Attachable Connectors (90° Male/Female)

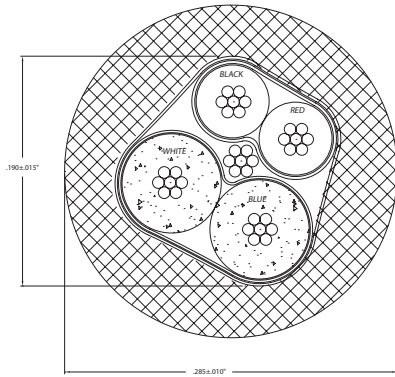


Like the straight Micro/Mid Field-attachable Connectors, the 90° field attachable connectors allow you to make field connections to bulk cable. The 90° connectors are particularly well suited for tight spaces like the back of displays where there is limited space for a straight connector.

- Useful in tight spaces or where sharp corners need to be made
- Waterproof rated to IP67

Copyright 2009 Maretron, LLP. All rights reserved. As Maretron is constantly improving its products, all specifications are subject to change without notice. Maretron's products are designed to be accurate and reliable; however, they should be used only as aids to navigation and vessel monitoring, and not as a replacement for traditional navigation and vessel monitoring techniques. A prudent captain or navigator never relies on a single source for navigation or system monitoring information. "NMEA 2000" is a registered trademark of the National Marine Electronics Association.

Micro Bulk Cable



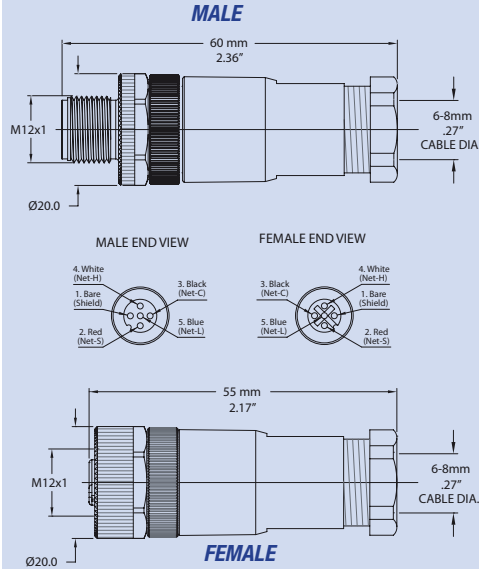
Specifications

OVERALL	
Outer Jacket Mat/Color:	PVC/Gray
Insulation Material:	PE (data wires), SRPVC (power wires)
Construction:	4x22 (0.65mm) AWG, 22 (0.65mm) AWG Drain
Shielding (3 Levels):	FOIL (overall), FOIL (power pair), FOIL (data pair)
POWER PAIR	
Wire:	2X22 (0.65mm) AWG
Resistance/Conductor:	18.1 Ohms/1000ft
Max Amperage:	6 Amps
Color Code:	Red/Black
DATA PAIR	
Wire:	2X22 (0.65mm) (AWG)
Characteristic Impedance:	120 Ohms ± 10%
Capacitance:	11.33pF/FT ± 10%
Color Code:	White/Blue
APPROVALS	
UL:	PLTC 75°C Sunlight Resistant E90625, AWM 80°C 300V
CSA:	CMX-OUTDOOR-CMG LL54185 75°C, AWM I/II A/B 80C 300V FT4
NMEA:	NMEA 2000® Approved
IEC:	IEC-61162-3

Products

PART NUMBER	DESCRIPTION
CG1	Micro Bulk Cable (Per Meter)
CG1-100	Micro Bulk Cable (Per 100 Meter Spool-Gray)

Micro/Mid Field-Attachable Connectors (Straight)



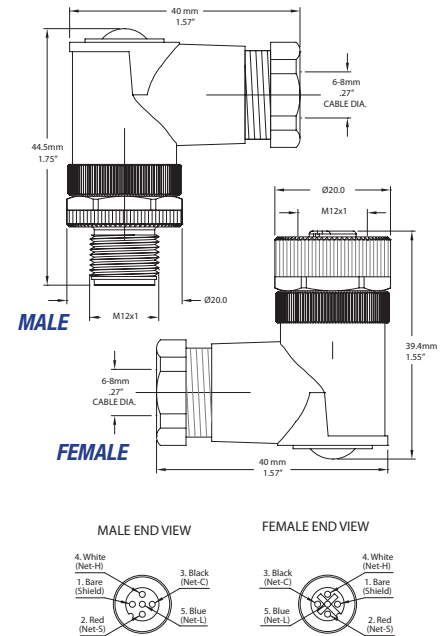
Specifications

MECHANICAL	
Housing Mat/Plating:	Nylon/Black
Contact Mat/Plating:	Brass/Gold
Coupling Nut Mat/Plating:	Brass/Nickel
Maximum Wire Size:	18 (1.02mm) AWG
Cable Grip Range:	6-8 mm
ELECTRICAL	
Rated Current:	4.0 Amps
Rated Voltage:	30 V AC/ 36 V DC
ENVIRONMENTAL	
Protection Class:	IEC IP67
Temperature Range:	-40°C TO 85°C (-40°F to 185°F)
APPROVALS	
NMEA:	NMEA 2000® Approved
IEC:	IEC-61162-3

Products

PART NUMBER	DESCRIPTION
FA-CF-ST	Micro/Mid Field Attachable Connector (Straight Female)
FA-CM-ST	Micro/Mid Field Attachable Connector (Straight Male)

Micro/Mid Field-Attachable Connectors (90°)



Specifications

MECHANICAL	
Housing Mat/Plating:	Nylon/Black
Contact Mat/Plating:	Brass/Optaloy
Coupling Nut Mat/Plating:	Brass/Nickel
Maximum Wire Size:	18 (1.02mm) AWG
Cable Grip Range:	6-8 mm
ELECTRICAL	
Rated Current:	4.0 Amps
Rated Voltage:	30 V AC/ 36 V DC
ENVIRONMENTAL	
Protection Class:	IEC IP67
Temperature Range:	-40°C TO 85°C (-40°F to 185°F)
APPROVALS	
NMEA:	NMEA 2000® Approved
IEC:	IEC-61162-3

Products

PART NUMBER	DESCRIPTION
FA-CF-90	Micro/Mid Field Attachable Connector (90° Female)
FA-CM-90	Micro/Mid Field Attachable Connector (90° Male)

Micro Double-Ended Cordsets



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 they are waterproof for continued operation even while submerged in the bilge.

- Rugged, IP68 rated connectors for continued connection integrity in marine environments
- Various cable lengths to match installation requirements

Micro Tee



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

Micro/Mid Powertap Tee

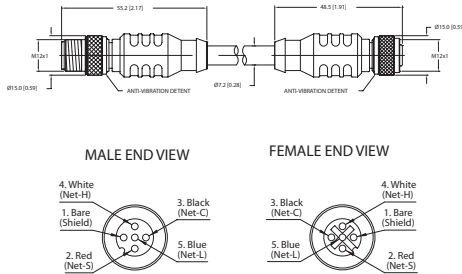


A Powertap Tee is connected to a network backbone just like any Tee but rather than connecting a device their purpose is to provide “bus” power. Maretron Powertap Tee uniquely provides two power inputs permitting doubled power provision for devices.

- Yellow cable indicates power and can't be confused with gray network cable
- Two cable lengths to match installation requirements

Copyright 2009 Maretron, LLP. All rights reserved. As Maretron is constantly improving its products, all specifications are subject to change without notice. Maretron's products are designed to be accurate and reliable; however, they should be used only as aids to navigation and vessel monitoring, and not as a replacement for traditional navigation and vessel monitoring techniques. A prudent captain or navigator never relies on a single source for navigation or system monitoring information. "NMEA 2000" is a registered trademark of the National Marine Electronics Association.

Micro Double-Ended Cordsets



Specifications

MECHANICAL

Contact Carrier Mat/Color: Thermoplastic PUR/Blue-Gray
 Molded Body Mat/Color: Thermoplastic PUR/Blue-Gray
 Contact Mat/Plating: Brass/Gold
 Coupling Nut Mat/Plating: Brass/Nickel
 Connector Outside Diameter: 0.59"

ELECTRICAL

Current Rating: 4.0 Amps
 Voltage Rating: 250 V

CABLE

Outer Jacket Mat/Color: PVC/Gray
 Conductor Insulation Material: HDPE (data pair), SRPVC (power pair)
 Number of Conductors: 4X22 AWG, 22 AWG Drain Wire
 Shielding (3-Levels): FOIL (Overall), FOIL (Power Pair), FOIL (Data Pair)

ENVIRONMENTAL

Protection Class: IEC IP68, NEMA 1,3,4,6P
 Temperature Rating: -40°C to 80°C to (-40°F to 176°F)

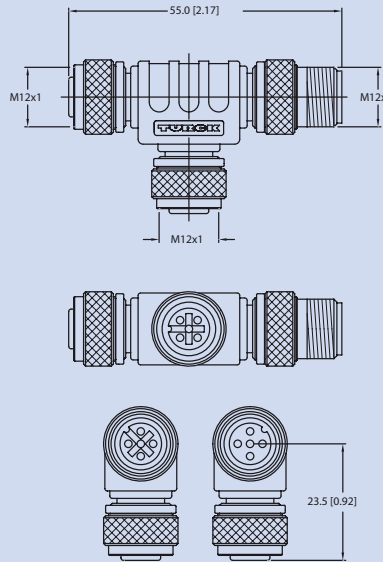
APPROVALS

(Cable) UL: PLTC 75°C Sunlight Resistant E90625, AWM 80°C 300V
 (Cable) CSA: CMX-OUTDOOR-CMG LL54185 75°C, AWM I/II A/B 80C 300V FT4
 NMEA: NMEA 2000® Approved
 IEC: IEC 61162-3

Products

PART NUMBER	DESCRIPTION
CM-CG1-CF-00.5	Micro Double-Ended Cordset - M to F - 0.5M (gray)
CM-CG1-CF-01.0	Micro Double-Ended Cordset - M to F - 1M (gray)
CM-CG1-CF-02.0	Micro Double-Ended Cordset - M to F - 2M (gray)
CM-CG1-CF-03.0	Micro Double-Ended Cordset - M to F - 3M (gray)
CM-CG1-CF-04.0	Micro Double-Ended Cordset - M to F - 4M (gray)
CM-CG1-CF-05.0	Micro Double-Ended Cordset - M to F - 5M (gray)
CM-CG1-CF-06.0	Micro Double-Ended Cordset - M to F - 6M (gray)
CM-CG1-CF-07.0	Micro Double-Ended Cordset - M to F - 7M (gray)
CM-CG1-CF-08.0	Micro Double-Ended Cordset - M to F - 8M (gray)
CM-CG1-CF-09.0	Micro Double-Ended Cordset - M to F - 9M (gray)
CM-CG1-CF-10.0	Micro Double-Ended Cordset - M to F - 10M (gray)

Micro Tee



Specifications

MECHANICAL

Molded Body Mat/Color: Thermoplastic PUR/Blue
 Contact Carrier Mat/Color: PA 6 (Nylon)/Black
 Contact Mat/Plating: Brass/Gold
 Coupling Nut Mat/Plating: Brass/Nickel

ELECTRICAL

Rated Current: 4.0 Amps
 Rated Voltage: 60 V

ENVIRONMENTAL

Protection Class: IEC IP67, NEMA 1,3,4,6
 Operating Temperature: -40°C TO 80°C (-40°F to 176°F)

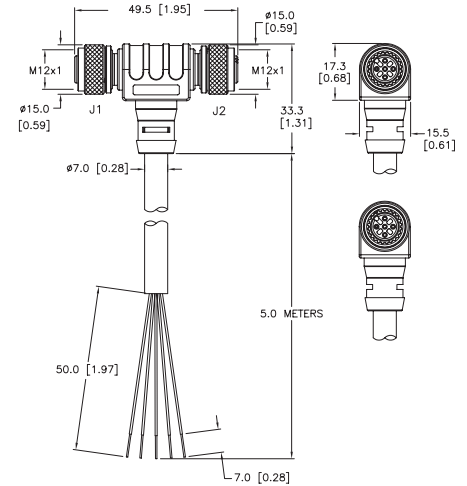
APPROVALS

NMEA: NMEA 2000® Approved
 IEC: IEC 61162-3

Products

PART NUMBER	DESCRIPTION
CM-CF-CF	Micro Tee

Micro/Mid Powertap Tees



Color	Name	Usage	Connector
Blue	NET-C	Ground	J1
Brown	NET-S	Power	J1
Gray	SHIELD	Drain	J1 & J2
Black	NET-C	Ground	J2
White	NET-S	Power	J2

Specifications

MECHANICAL

Molded Body Mat/Color: Thermoplastic PUR/Yellow
 Contact Carrier Mat/Color: Thermoplastic PUR/Black
 Contact Mat/Plating: Brass/Gold
 Coupling Nut Mat/Plating: Brass/Nickel
 Cable Jacket Mat/Color: PVC/ Yellow
 Conductor Insulation Mat: PVC
 Number of Conductors: 5x18 (1.02mm) AWG

ELECTRICAL

Voltage Rating: 250 V
 Max Amperage: 4.0 Amps

ENVIRONMENTAL

Protection Class: IEC IP67, NEMA 1,3,4,6P
 Operating Temperature: -40°C to 105°C (-40°F to 221°F)

APPROVALS

NMEA: NMEA 2000® Approved
 IEC: IEC 61162-3

Products

PART NUMBER	DESCRIPTION
CF-SPWR05-CF	Micro/Mid Powertap Tee - FM (left)/ 5 Meter 4 Wire Power drop (bottom)/FM (right)

Micro Termination Resistors



Two termination resistors are required on every NMEA 2000 network, one on each end of the trunk line. Normally, a male termination is used since male pins tend to point back to the power source. In cases 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.

- Screw terminal connector for positive connections
- Termination resistors are used to terminate both ends of the trunk line

Micro Bulkhead Feed-Thru



The Bulkhead Feed-Thru allows ease of installation through panels or bulkheads and establishes future connection points in a network installation. The bulkhead feed-thru also maintains the integrity of watertight bulkheads by providing a waterproof seal and connection.

- Features rugged keyways for positive alignment of connections
- Waterproof rated to IP67

Multiport Box (Micro-Mid Male Homerun / Micro-Mid Female Drops)

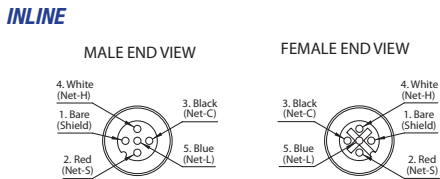
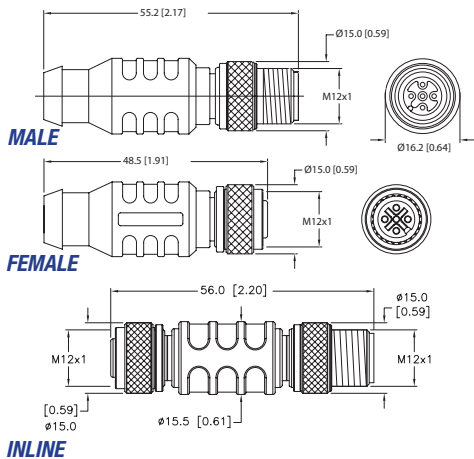


Multiport boxes allow several drop cables to be consolidated and connected back to the trunk, which eliminates the need to have numerous tees connected near a single point. Multiport boxes connect back to the trunk through a double-ended cordset and Tee.

- Ideal for consolidating many connections; for example behind dashboards
- Requires the purchase of an additional double-ended cordset for connection back to the trunk

Copyright 2009 Maretron, LLP. All rights reserved. As Maretron is constantly improving its products, all specifications are subject to change without notice. Maretron's products are designed to be accurate and reliable; however, they should be used only as aids to navigation and vessel monitoring, and not as a replacement for traditional navigation and vessel monitoring techniques. A prudent captain or navigator never relies on a single source for navigation or system monitoring information. "NMEA 2000" is a registered trademark of the National Marine Electronics Association.

Micro Termination Resistors



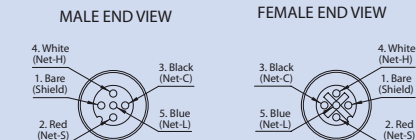
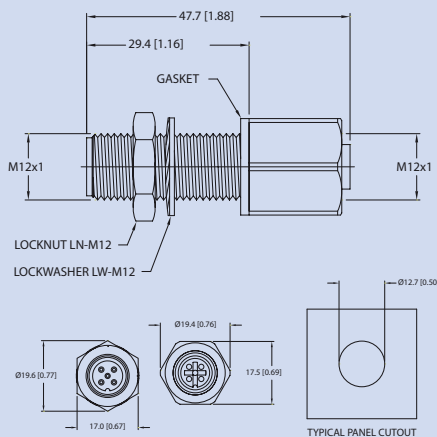
Specifications

MECHANICAL	
Molded Body Mat/Color:	Thermoplastic PUR/Blue-Gray – TR-CM, TR-CF
Contact Carrier Mat/Color:	Thermoplastic PUR/Black – IT-CM-CF
Contact Mat/Plating:	Thermoplastic PUR/Blue-Gray – TR-CM, TR-CF
Brass/Gold	Thermoplastic PUR/Black – IT-CM-CF
Coupling Nut Mat/Plating:	Brass/Nickel
ELECTRICAL	
Rated Voltage:	10-30 V DC
Internal Resistor:	120 Ohms (1/2 W) – TR-CM, TR-CF 121 Ohms (1/4 W) – IT-CM-CF
ENVIRONMENTAL	
Protection Class:	IEC IP68, NEMA 1,3,4,6P
APPROVALS	
NMEA:	NMEA 2000® APPROVED
IEC:	IEC 61162-3

Products

PART NUMBER	DESCRIPTION
TR-CM	Micro Termination Resistor (Male)
TR-CF	Micro Termination Resistor (Female)
IT-CM-CF	Micro Inline Terminator

Micro Bulkhead Feed-Thru



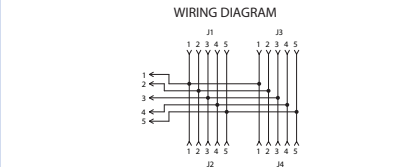
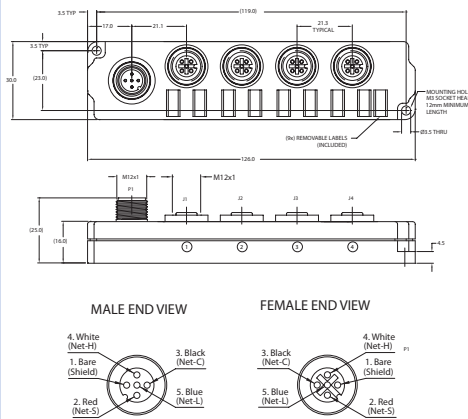
Specifications

MECHANICAL	
Contact Carrier Mat/Color:	PA 6 (Nylon)/Blue-Gray
Contact Mat/Plating:	Brass/Gold
Housing Mat/Plating:	Brass/Nickel
Gasket Material:	Nitrile (Buna N)
Accommodates Wall (thick):	.40" (1.0 mm) to .875" (22.2 mm)
ELECTRICAL	
Voltage Rating:	250 V
Max Amperage:	4.0 Amps
Number of Conductors:	5x22 (0.65mm) AWG
ENVIRONMENTAL	
Protection Class:	IEC IP67, NEMA 1,3,4,6
Temperature Range:	-40°C to 105°C (-40°F to 221°F)
APPROVALS	
NMEA:	NMEA 2000® APPROVED
IEC:	IEC 61162-3

Products

PART NUMBER	DESCRIPTION
BHF-CM-CF	Micro Bulkhead Feed-Thru

Multiport Box (Micro-Mid Male Homerun / Micro-Mid Female Drops)



Specifications

MECHANICAL	
Housing Mat/Color:	Nylon/Blue-Gray
Receptacle Mat/Plating:	Brass/Nickel
Contact Carrier Mat/Color:	Nylon/Black
Contact Mat/Plating:	Brass/Gold
ELECTRICAL	
Operating Voltage:	250 V
Operating Current:	4.0 Amps
ENVIRONMENTAL	
Protection Class:	IP67 – when receptacles are covered
Operating Temperature:	-30°C to 80°C (-22°F to 176°F)
APPROVALS	
NMEA:	NMEA 2000® Approved
IEC:	IEC 61162-3

Products

PART NUMBER	DESCRIPTION
CM-CF-4	Multiport Box (Micro-Mid Male Homerun / Micro-Mid Female Drops)

Mid Bulk Cable (Gray/Blue)



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 for maximum flexibility as cables can be made on the job to exact lengths.

- Meets and exceeds NMEA 2000® specifications for the highest reliability
- Used with field-attachable connectors to build exact length cables at the job site
- Optimized for voltage drop sensitive networks (long runs) because power pair wires have half the resistance of Micro cable

Mid Double-Ended Cordsets (Gray)



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 even while submerged in the bilge.

- Rugged, IP68 rated connectors for continued connection integrity in marine environments
- Various cable lengths to match installation requirements
- Optimized for voltage drop sensitive networks (long runs) because power pair wires have half the resistance of Micro cable

Mid Double-Ended Cordsets (Blue)

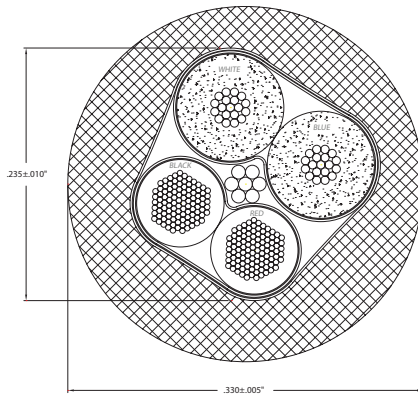


Double-ended cordsets are used for trunk or drop lines and make for a secure connection and simple timesaving installation. The connectors are keyed for error-free connection and are waterproof for continued operation even while submerged in the bilge.

- Rugged, IP68 rated connectors for continued connection integrity in marine environments
- Various cable lengths to match installation requirements
- Optimized for voltage drop sensitive networks (long runs) because power pair wires have half the resistance of Micro cable

Copyright 2009 Maretron, LLP. All rights reserved. As Maretron is constantly improving its products, all specifications are subject to change without notice. Maretron's products are designed to be accurate and reliable; however, they should be used only as aids to navigation and vessel monitoring, and not as a replacement for traditional navigation and vessel monitoring techniques. A prudent captain or navigator never relies on a single source for navigation or system monitoring information. "NMEA 2000" is a registered trademark of the National Marine Electronics Association.

Mid Bulk Cable (Gray/Blue)



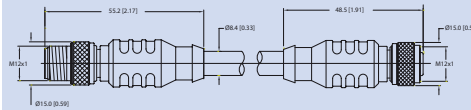
Specifications

OVERALL	
Outer Jacket Mat/Color:	PVC/Gray – DG1 PVC/Blue – DB1
Insulation Material:	PE (data wires), PVC (power wires)
Construction:	2x16 (1.29mm) AWG, 2x20 (0.81mm) AWG, 20 (0.81mm) AWG Drain Wire
Shielding (3 levels):	Foil (overall), Foil (power pair), Foil (data pair)
POWER PAIR	
Wire:	2x16 (1.29mm) AWG
Resistance/Conductor:	4.1 Ohms/1000 ft max
Max Amperage:	14 Amps
Color Code:	Red/Black
DATA PAIR	
Wire:	2x20 (0.81mm) (AWG)
Characteristic Impedance:	120 Ohms ± 10%
Capacitance:	10.75 pF/ft
Color Code:	White/Blue
APPROVALS	
UL:	PLTC 75°C Sunlight Resistant E90625, AWM 80°C 300V
CSA:	CMX-OUTDOOR-CMG LL54185 75°C, AWM VII A/B 80C 300V FT4
NMEA:	NMEA 2000® Approved
IEC:	IEC-61162-3

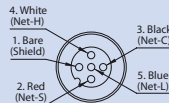
Products

PART NUMBER	DESCRIPTION
DG1	Mid Bulk Cable (Per Meter-Gray)
DG1-100	Mid Bulk Cable (Per 100 Meter Spool-Gray)
DB1	Mid Bulk Cable (Per Meter-Blue)
DB1-100	Mid Bulk Cable (Per 100 Meter Spool-Blue)

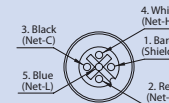
Mid Double-Ended Cordsets (Gray)



MALE END VIEW



FEMALE END VIEW



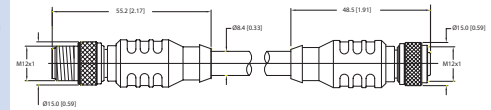
Specifications

MECHANICAL	
Contact Carrier Mat/Color:	Thermoplastic PUR/Blue-Gray
Molded Body Mat/Color:	Thermoplastic PUR/Blue-Gray
Contact Mat/Plating:	Brass/Gold
Coupling Nut Mat/Plating:	Brass/Nickel
Connector Outside Diameter:	0.59"
ELECTRICAL	
Current Rating:	4.0 Amps
Voltage Rating:	250 V
CABLE	
Outer Jacket Mat/Color:	PVC/Gray
Conductor	PE (data pair), PVC (power pair)
Insulation Material:	2x16 (1.29mm) AWG, Data 2x20 (0.81mm) AWG, 20 (0.81mm) AWG Drain Wire
Number of Conductors:	Alum/Polyester Foil (Overall), Foil (Power Pair), Foil (Data Pair)
Shielding (3 Levels):	
ENVIRONMENTAL	
Protection Class:	IEC IP68, NEMA 1,3,4,6P
Temperature Rating:	-40°C to 80°C to (-40°F to 176°F)
APPROVALS	
(Cable) UL:	PLTC 75°C Sunlight Resistant E90625, AWM 80°C 300V
(Cable) CSA:	CMX-OUTDOOR-CMG LL54185 75°C, AWM VII A/B 80C 300V FT4
NMEA:	NMEA 2000® Approved
IEC:	IEC 61162-3

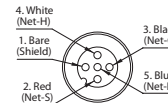
Products

PART NUMBER	DESCRIPTION
DM-DG1-DF-00.5	Mid Double-Ended Cordset - M to F - 0.5M (gray)
DM-DG1-DF-01.0	Mid Double-Ended Cordset - M to F - 1M (gray)
DM-DG1-DF-02.0	Mid Double-Ended Cordset - M to F - 2M (gray)
DM-DG1-DF-03.0	Mid Double-Ended Cordset - M to F - 3M (gray)
DM-DG1-DF-04.0	Mid Double-Ended Cordset - M to F - 4M (gray)
DM-DG1-DF-05.0	Mid Double-Ended Cordset - M to F - 5M (gray)
DM-DG1-DF-06.0	Mid Double-Ended Cordset - M to F - 6M (gray)
DM-DG1-DF-07.0	Mid Double-Ended Cordset - M to F - 7M (gray)
DM-DG1-DF-08.0	Mid Double-Ended Cordset - M to F - 8M (gray)
DM-DG1-DF-09.0	Mid Double-Ended Cordset - M to F - 9M (gray)
DM-DG1-DF-10.0	Mid Double-Ended Cordset - M to F - 10M (gray)

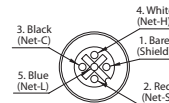
Mid Double-Ended Cordsets (Blue)



MALE END VIEW



FEMALE END VIEW



Specifications

MECHANICAL	
Contact Carrier Mat/Color:	Thermoplastic PUR/Blue-Gray
Molded Body Mat/Color:	Thermoplastic PUR/Blue-Gray
Contact Mat/Plating:	Brass/Gold
Coupling Nut Mat/Plating:	Brass/Nickel
Connector Outside Diameter:	0.59"
ELECTRICAL	
Current Rating:	4.0 Amps
Voltage Rating:	250 V
CABLE	
Outer Jacket Mat/Color:	PVC/Blue
Conductor	PE (data pair), PVC (power pair)
Insulation Material:	2x16 (1.29mm) AWG, 2x20 (0.81mm) AWG, 20 (0.81mm) AWG Drain Wire
Number of Conductors:	Foil (Overall), Foil (Power Pair), Foil (Data Pair)
Shielding (3 Levels):	
ENVIRONMENTAL	
Protection Class:	IEC IP68, NEMA 1,3,4,6P
Temperature Rating:	-40°C to 80°C to (-40°F to 176°F)
APPROVALS	
(Cable) UL:	PLTC 75°C Sunlight Resistant E90625, AWM 80°C 300V
(Cable) CSA:	CMX-OUTDOOR-CMG LL54185 75°C, AWM VII A/B 80C 300V FT4
NMEA:	NMEA 2000® Approved
IEC:	IEC 61162-3

Products

PART NUMBER	DESCRIPTION
DM-DB1-DF-00.5	Mid Double-Ended Cordset - M to F - 0.5M (blue)
DM-DB1-DF-01.0	Mid Double-Ended Cordset - M to F - 1M (blue)
DM-DB1-DF-02.0	Mid Double-Ended Cordset - M to F - 2M (blue)
DM-DB1-DF-03.0	Mid Double-Ended Cordset - M to F - 3M (blue)
DM-DB1-DF-04.0	Mid Double-Ended Cordset - M to F - 4M (blue)
DM-DB1-DF-05.0	Mid Double-Ended Cordset - M to F - 5M (blue)
DM-DB1-DF-06.0	Mid Double-Ended Cordset - M to F - 6M (blue)
DM-DB1-DF-07.0	Mid Double-Ended Cordset - M to F - 7M (blue)
DM-DB1-DF-08.0	Mid Double-Ended Cordset - M to F - 8M (blue)
DM-DB1-DF-09.0	Mid Double-Ended Cordset - M to F - 9M (blue)
DM-DB1-DF-10.0	Mid Double-Ended Cordset - M to F - 10M (blue)

Nylon to Metal Connector Cable



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
- Waterproof rated to IP67

Micro 90° Male to Female Connector



A 90 degree male to female connector for Micro or Mid size cable runs or connections which is 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
- Waterproof rated to IP67

Mid Single-Ended Cordset Female to Open Pigtail (25 Meter Blue)

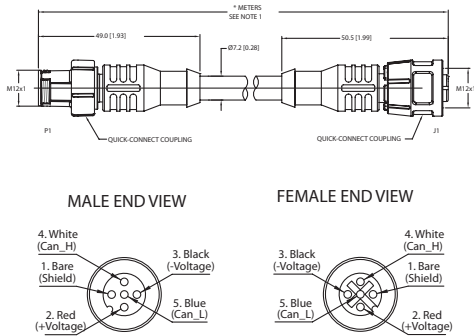


This 25 meter length Mid size cable with a Micro female connector on one end is intended for installation of devices such as Maretron's WSO100 Weather Station. The female connector should point towards the device and a field attachable male connector should be made onto the end connecting to the rest of the backbone.

- NMEA 2000® Approved
- Meets ABYC Power Pair size requirements
- Waterproof rated to IP67

Copyright 2009 Maretron, LLP. All rights reserved. As Maretron is constantly improving its products, all specifications are subject to change without notice. Maretron's products are designed to be accurate and reliable; however, they should be used only as aids to navigation and vessel monitoring, and not as a replacement for traditional navigation and vessel monitoring techniques. A prudent captain or navigator never relies on a single source for navigation or system monitoring information. "NMEA 2000" is a registered trademark of the National Marine Electronics Association.

Nylon to Metal Connector Cable



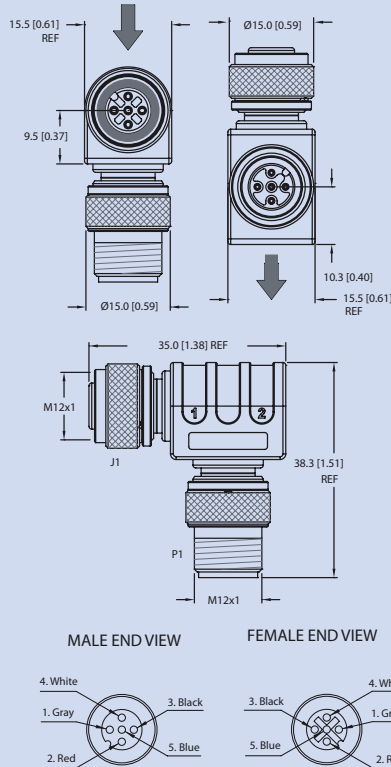
Specifications

MECHANICAL	
Molded Head Mat/Color:	Thermoplastic PUR/Blue-Gray
Contact Carrier Mat/Color:	Thermoplastic PUR/Black
Contact Mat/Plating:	Brass/Gold
Snap-Lock Mat/Color:	POM/Black
ELECTRICAL	
Rated Current:	4.0 Amps
Rated Voltage:	250 V
CABLE	
Outer Jacket Mat/Color:	PVC/Gray
Conductor Insulation Mat:	HDPE (Data), SRPVC (Power Pair)
Number of Conductors:	4X22 (0.65mm) AWG, 22 (0.65mm) AWG Drain Wire
Shielding (3-Levels):	Foil (Overall), Foil (Power Pair), Foil (Data Pair)
ENVIRONMENTAL	
Protection Class:	IEC IP67
Temperature Range:	-40°C to 80°C (-40°F to 176°F)
APPROVALS	
NMEA:	NMEA 2000® Approved
IEC:	IEC 61162-3

Products

PART NUMBER	DESCRIPTION
QCM-CG1-QCF-01	Nylon to Metal Connector Cable

Micro 90° Male to Female Connector



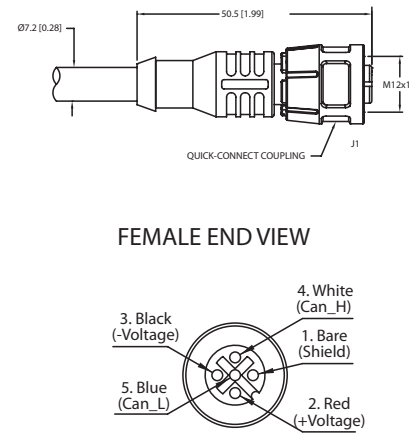
Specifications

MECHANICAL	
Molded Body Mat/Color:	Thermoplastic PUR/Gray
Contact Carrier Mat/Color:	Nylon PUR
Contact Mat/Plating:	Brass/Gold
Coupling Nut Mat/Plating:	Brass/Nickel
ELECTRICAL	
Rated Current:	4.0 Amps
Rated Voltage:	50 V
ENVIRONMENTAL	
Protection Class:	IEC IP67, NEMA 1,3,4,6P
Temperature Range:	-40°C to 105°C (-40°F to 221°F)
APPROVALS	
NMEA:	NMEA 2000® Approved
IEC:	IEC 61162-3

Products

PART NUMBER	DESCRIPTION
ELB-CM-CF	Micro 90° Male to Female Connector

Mid Single-Ended Cordset Female to Open Pigtail



Specifications

MECHANICAL	
Molded Head Mat/Color:	Thermoplastic PUR/Black
Contact Carrier Mat/Color:	Thermoplastic PUR/Blue-Gray
Contact Mat/Plating:	Brass/Gold
Snap-Lock Mat/Color:	POM/Black
ELECTRICAL	
Rated Current:	4.0 Amps
Rated Voltage:	250 V
CABLE	
Outer Jacket Mat/Color:	PVC/Gray
Conductor Insulation Mat:	HDPE (Data), SRPVC (Power Pair)
Number of Conductors:	4X22 (0.65mm) AWG, 22 (0.65mm) AWG Drain Wire
Shielding (3-Levels):	Foil (Overall), Foil (Power Pair), Foil (Data Pair)
ENVIRONMENTAL	
Protection Class:	IEC IP67
Temperature Range:	-40°C to 80°C (-40°F to 176°F)
APPROVALS	
NMEA:	NMEA 2000® Approved
IEC:	IEC 61162-3

Products

PART NUMBER	DESCRIPTION
DF-DB1-25.0	Mid Single-Ended Cordset – Female to Open Pigtail – 25 Meter (blue)

Mini Bulk Cable (Gray/Blue)



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
- Trunk or drop cable for use with Mini connectors
- Used with field-attachable connectors to build exact length cables at the job site

Mini Field-Attachable Connector (Male/Female)



Field-attachable connectors allow you to make field connections to bulk cable. The color-coded screw terminals match the individual wire colors found within the bulk cables for error-free field installation.

- Color-coded screw terminators make for error-free field installation
- Rugged housing material designed to withstand harsh marine environments

Mini Double-Ended Cordset (Gray)

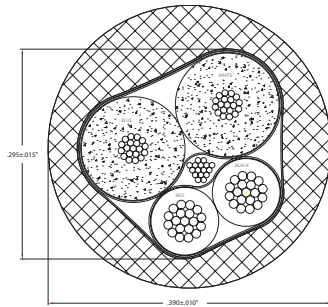


Double-ended cordsets are used for trunk or drop lines and make for a secure connection and simple timesaving installation. The connectors are keyed for error-free connection and are waterproof for continued operation even while submerged in the bilge.

- Rugged, IP68 rated connectors for continued connection integrity in marine environment
- Various cable lengths to match installation requirements

Copyright 2009 Maretron, LLP. All rights reserved. As Maretron is constantly improving its products, all specifications are subject to change without notice. Maretron's products are designed to be accurate and reliable; however, they should be used only as aids to navigation and vessel monitoring, and not as a replacement for traditional navigation and vessel monitoring techniques. A prudent captain or navigator never relies on a single source for navigation or system monitoring information. "NMEA 2000" is a registered trademark of the National Marine Electronics Association.

Mini Bulk Cable (Gray/Blue)



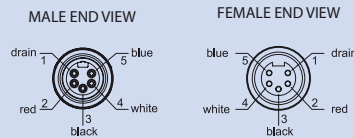
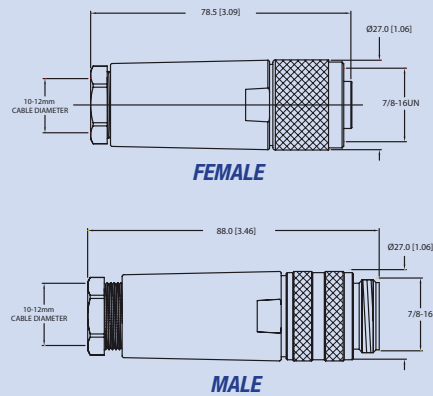
Specifications

OVERALL	
Outer Jacket Mat/Color:	PVC/Blue – NB1 PVC/Gray – NG1
Insulation Material:	PE (data), PVC (power)
Construction:	2x15 (1.45mm) AWG, 2x18 (1.02mm) AWG, 18 (1.02mm) AWG Drain Wire
Shielding (3 Levels):	Foil (overall), Foil (power pair), Foil (data pair)
POWER PAIR	
Wire:	2x15 (1.45mm) AWG
Resistance/Conductor:	3.44 Ohms/1000 ft max
Max Amperage:	16 Amps – NB1 14 Amps – NG1
Color Code:	Red/Black
DATA PAIR	
Wire:	2x18 (1.02mm) AWG
Characteristic Impedance:	120 Ohms ± 10%
Capacitance:	12 pF/1000 ft Max
Color Code:	White/Blue
APPROVALS	
UL:	PLTC 75°C Sunlight Resistant E90625, AWM 80°C 300V
CSA:	CMX-OUTDOOR-CMG LL54185 75°C, AWM I/II A/B 80C 300V FT4
NMEA:	NMEA 2000® APPROVED
IEC:	IEC-61162-3

Products

PART NUMBER	DESCRIPTION
NG1	Mini Bulk Cable (Per Meter-Gray)
NG1-100	Mini Bulk Cable (Per 100 Meter Spool-Gray)
NB1	Mini Bulk Cable (Per Meter-Blue)
NB1-100	Mini Bulk Cable (Per 100 Meter Spool-Blue)

Mini Field-Attachable Connector (Male/Female)



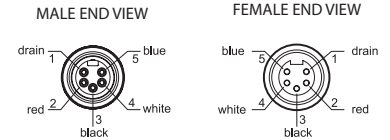
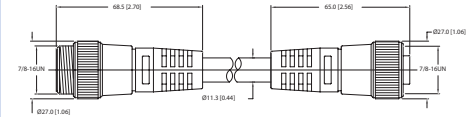
Specifications

MECHANICAL	
Housing Mat/Color:	Glass Filled Nylon/Black
Contact Mat/Plating:	Brass/Gold
Coupling Nut Material:	Anodized Aluminum
Maximum Wire Size:	16 (1.29mm) AWG
Termination Method:	Screw Terminal
ELECTRICAL	
Rated Current:	9.0 Amps
Rated Voltage:	250 Volts
ENVIRONMENTAL	
Protection Class:	IEC IP67
Temperature Range:	-40°C to 85°C (-40°F to 185°F)
APPROVALS	
NMEA:	NMEA 2000® Approved
IEC:	IEC-61162-3

Products

PART NUMBER	DESCRIPTION
FA-NF-ST	Mini Field Attachable Connector (Female)
FA-NM-ST	Mini Field Attachable Connector (Male)

Mini Double-Ended Cordset (Gray)



Specifications

MECHANICAL	
Contact Carrier Mat/Color:	Thermoplastic PUR/Blue-Gray
Molded Head Mat/Color:	Thermoplastic PUR/Blue-Gray
Contact Mat/Plating:	Brass/Gold
Coupling Nut Mat/Plating:	Brass/Nickel
Connector Outside Diameter:	1.06"
ELECTRICAL	
Current Rating:	9.0 Amps
Voltage Rating:	300 V
CABLE	
Outer Jacket Mat/Color:	PVC/Gray
Conductor Insulation Material:	PE (data pair), PVC (power pair)
Number of Conductors:	Power 2x15 (1.45mm) AWG, 2x18 (1.02mm) AWG, 18 (1.02mm) AWG Drain Wire
Shielding (3-Levels):	Braid (Overall), Foil (Power Pair), Foil (Data Pair)
ENVIRONMENTAL	
Protection Class:	IEC IP68, NEMA 1,3,4,6P
Temperature Rating:	-40°C to 80°C (-40°F to 176°F)
APPROVALS	
(Cable) UL:	PLTC 75°C Sunlight Resistant E90625, AWM 80°C 300V
(Cable) CSA:	CMX-OUTDOOR-CMG LL54185 75°C, AWM I/II A/B 80C 300V FT4
NMEA:	NMEA 2000® Approved
IEC:	IEC 61162-3

Products

PART NUMBER	DESCRIPTION
NM-NG1-NF-00.5	Mini Double-Ended Cordset - M to F - 0.5M (gray)
NM-NG1-NF-01.0	Mini Double-Ended Cordset - M to F - 1M (gray)
NM-NG1-NF-02.0	Mini Double-Ended Cordset - M to F - 2M (gray)
NM-NG1-NF-03.0	Mini Double-Ended Cordset - M to F - 3M (gray)
NM-NG1-NF-04.0	Mini Double-Ended Cordset - M to F - 4M (gray)
NM-NG1-NF-05.0	Mini Double-Ended Cordset - M to F - 5M (gray)
NM-NG1-NF-06.0	Mini Double-Ended Cordset - M to F - 6M (gray)
NM-NG1-NF-07.0	Mini Double-Ended Cordset - M to F - 7M (gray)
NM-NG1-NF-08.0	Mini Double-Ended Cordset - M to F - 8M (gray)
NM-NG1-NF-09.0	Mini Double-Ended Cordset - M to F - 9M (gray)
NM-NG1-NF-10.0	Mini Double-Ended Cordset - M to F - 10M (gray)

Mini Double-Ended Cordset (Blue)



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 even while submerged in the bilge.

- Rugged, IP67 rated connectors for continued connection integrity in marine environment
- Various cable lengths to match installation requirements

Mini Tees



A Tee is used to tap into the trunk line for adding a drop connection. Two Mini Tees are available: 1) a Mini Tee with Mini connectors for the trunk and drop lines, and 2) a Mini/Micro Tee with Mini connectors for the trunk lines and a Micro connector for the drop line.

- Gold Contacts for greatest reliability
- Keyed connectors for error-free connections

Mini Powertap / Mini Power Cord

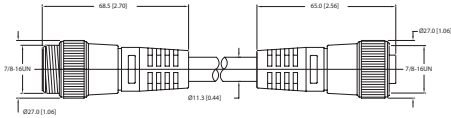


A Powertap is connected to a network backbone just like any Tee but rather than connecting a device, its purpose is to provide "bus" power. Typically a Powertap is placed as central as possible between total devices on backbone. Maretron Powertap uniquely provides two power inputs permitting doubled power provision for devices.

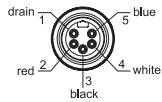
- Connects power supply to NMEA 2000® Trunk Line in convenient plug/play fashion
- Replaceable fuses to protect bus and connected components from excessive current

Copyright 2009 Maretron, LLP. All rights reserved. As Maretron is constantly improving its products, all specifications are subject to change without notice. Maretron's products are designed to be accurate and reliable; however, they should be used only as aids to navigation and vessel monitoring, and not as a replacement for traditional navigation and vessel monitoring techniques. A prudent captain or navigator never relies on a single source for navigation or system monitoring information. "NMEA 2000" is a registered trademark of the National Marine Electronics Association.

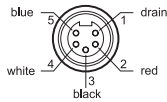
Mini Double-Ended Cordset (Blue)



MALE END VIEW



FEMALE END VIEW



Specifications

MECHANICAL

Contact Carrier Mat/Color:
Molded Body Mat/Color:
Contact Mat/Plating:
Coupling Nut Mat/Plating:
Connector Outside Diameter:

Thermoplastic PUR/Blue-Gray
Thermoplastic PUR/Blue-Gray
Brass/Gold
Brass/Nickel
1.06"

ELECTRICAL

Current Rating:
Voltage Rating:

9.0 Amps
300 V

CABLE

Outer Jacket Mat/Color:
Conductor Insulation Material:
Number of Conductors:

PVC/Blue
PE (data pair), PVC (power pair)
2x15 (1.45mm) AWG,
2x18 (1.02mm) AWG,
18 (1.02mm) AWG Drain Wire
Braid (Overall), Foil (Power Pair),
Foil (Data Pair)

Shielding (3-Levels):

ENVIRONMENTAL

Protection Class:
Temperature Rating:

IEC IP67, NEMA 1,3,4,6P
-40°C to 80°C (-40°F to 176°F)

APPROVALS

(Cable) UL:

PLTC 75°C Sunlight Resistant E90625,
AWM 80°C 300V

(Cable) CSA:

CMX-OUTDOOR-CMG LL54185 75°C,
AWM VII A/B 80C 300V FT4

NMEA:

NMEA 2000® Approved

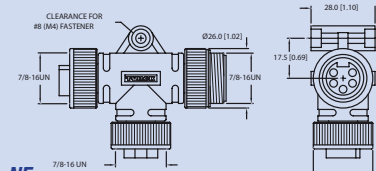
IEC:

IEC 61162-3

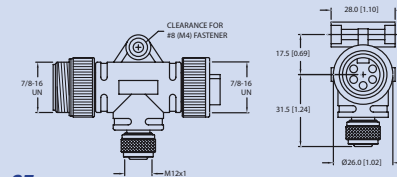
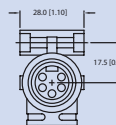
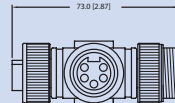
Products

PART NUMBER	DESCRIPTION
NM-NB1-NF-00.5	Mini Double-Ended Cordset - M to F - 0.5M (blue)
NM-NB1-NF-01.0	Mini Double-Ended Cordset - M to F - 1M (blue)
NM-NB1-NF-02.0	Mini Double-Ended Cordset - M to F - 2M (blue)
NM-NB1-NF-03.0	Mini Double-Ended Cordset - M to F - 3M (blue)
NM-NB1-NF-04.0	Mini Double-Ended Cordset - M to F - 4M (blue)
NM-NB1-NF-05.0	Mini Double-Ended Cordset - M to F - 5M (blue)
NM-NB1-NF-06.0	Mini Double-Ended Cordset - M to F - 6M (blue)
NM-NB1-NF-07.0	Mini Double-Ended Cordset - M to F - 7M (blue)
NM-NB1-NF-08.0	Mini Double-Ended Cordset - M to F - 8M (blue)
NM-NB1-NF-09.0	Mini Double-Ended Cordset - M to F - 9M (blue)
NM-NB1-NF-10.0	Mini Double-Ended Cordset - M to F - 10M (blue)

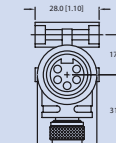
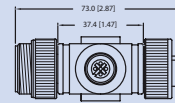
Mini Tees



NF



CF



Specifications

MECHANICAL

Molded Body Mat/Color:
Contact Carrier Mat/Color:
Contact Mat/Plating:
Coupling Nut Mat/Plating:

Thermoplastic PUR/Blue-Gray
Thermoplastic PUR/Blue-Gray
Brass/Gold
Brass/Nickel

ELECTRICAL

Rated Current:

9.0 Amps – **NM-NF-NF**
4.0 Amps (Micro) 9.0 Amps (Mini) – **NM-CF-NF**
600 V – **NM-NF-NF**
250 V – **NM-CF-NF**

Rated Voltage:

ENVIRONMENTAL

Protection Class:
Temperature Range:

IEC IP67, NEMA 1,3,4,6P
-40°C to 80°C (-40°F to 176°F)

APPROVALS

NMEA:

NMEA 2000® APPROVED

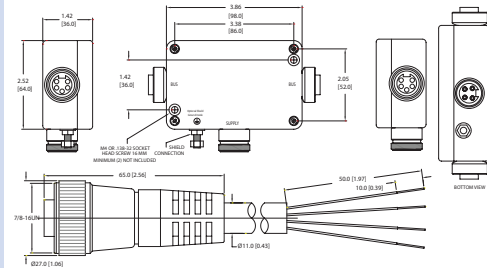
IEC:

IEC 61162-3

Products

PART NUMBER	DESCRIPTION
NM-NF-NF	Mini Tee
NM-CF-NF	Mini/Micro Tee

Mini Powertap / Mini Power Cord



Color	Name	Usage	Connector
Black	NET-C	Ground	V-1 & V-2
White	NET-S	Power	V+1 & V+2
Green	NET-C	Ground	V-1 & V-2
Red	NET-S	Power	V+1 & V+2

Specifications

ELECTRICAL

Operating Voltage:
Protection Circuit:

25 V min
Slo-Blo Fuse: 8 Amps, 250 V
Metric Fuse Block: 5x20 mm
Trip Time: 4 sec Min to 100 sec max
Type: MBR 3045PT
Max: Reverse Voltage VRWM=45 V
Max: Average Fwd Cur IFRM=30 Amps
Peak Surge Cur I=8.3 sec., IFSM=200 Amps
Max VI = 0.65 V @ 125°C and IF=20 Amps
16 AWG 8 Amps (Mini 5-Pin)
16 AWG 8 Amps (Mini 4-Pin)

Schottky Rectifier:

Bus Line Minimum Conductor:
Supply Line Minimum Conductor:

ENVIRONMENTAL

Temperature Range:
Storage Temperature:

-40°C to 70°C (-40°F to 158°F)
-40°C to 85°C (-40°F to 185°F)

APPROVALS

NMEA:

NMEA 2000® APPROVED

IEC:

IEC 61162-3

MECHANICAL

Molded Body Mat/Color:
Outer Jacket Mat/Color:
Contact Carrier Mat/Color:
Contact Mat/Plating:
Coupling Nut Mat/Plating:
Conductor Insulation Mat:

NM4P-01, NM4P-05

Thermoplastic PUR/Yellow
PVC/Yellow
Thermoplastic PUR/Yellow
Brass/Gold
Brass/Nickel
PVC

ELECTRICAL

Conductors:
Current Rating:
Voltage Rating:

4x16 (1.29mm) AWG
9.0 Amps
600 V

ENVIRONMENTAL

Protection Class:
Temperature Range:

IEC IP67, NEMA 1,3,4,6P
-40°C to 105°C (-40°F to 221°F)

APPROVALS

NMEA:

NMEA 2000® APPROVED

IEC:

IEC 61162-3

Products

PART NUMBER	DESCRIPTION
NF-NM4P-NF	Mini Powertap - Female-Female with Fuses
NM4P-01	Mini Power Cord - Female to Pigtail - 1 Meter
NM4P-05	Mini Power Cord - Female to Pigtail - 5 Meter

Mini Termination Resistor (Male/Female)



Termination Resistors are required on a NMEA 2000® network and are placed at each end of a 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 indicate correct polarity at a glance to ensure power connections have been made properly
- Screw connector for positive connection
- Termination resistors are used to terminate both ends of the trunk line

Mini 90° Male to Female Connector



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

- Mounting hole for secure fastening of cabling system
- Waterproof seals for reliable connections
- Nickel plated brass ideally suited for harsh marine environment

Mini Male to Micro Female Reducer

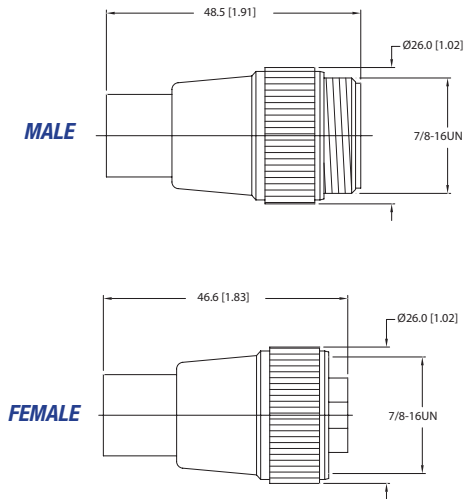


The reducer is used to change from a Mini cable to Micro or Mid cable. For example, one end of the network might be terminated at the top of the mast but it may not be desirable to run a Mini trunk cable up the mast. In this case, you can switch over to Micro or Mid cable at the base of the mast using the reducer and continue up the mast with Micro or Mid cable.

- Corrosion resistant Nickel plated Brass
- Weatherproof to IP67
- Reduces Mini Backbone to Micro/ Mid Cable

Copyright 2009 Maretron, LLP. All rights reserved. As Maretron is constantly improving its products, all specifications are subject to change without notice. Maretron's products are designed to be accurate and reliable; however, they should be used only as aids to navigation and vessel monitoring, and not as a replacement for traditional navigation and vessel monitoring techniques. A prudent captain or navigator never relies on a single source for navigation or system monitoring information. "NMEA 2000" is a registered trademark of the National Marine Electronics Association.

Mini Termination Resistor (Male/Female)



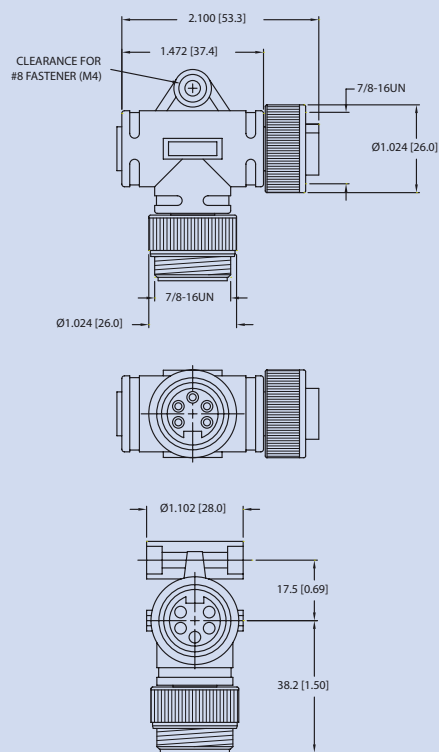
Specifications

MECHANICAL	Molded Body Mat/Color:	Thermoplastic PUR/Blue-Gray – TR-NM, TR-NF
	Contact Carrier Mat/Color:	Thermoplastic PUR/Clear – TRL-NM, TRL-NF
ELECTRICAL	Rated Voltage:	300 V DC
	Internal Resistor:	120 Ohms (1/2 W)
ENVIRONMENTAL	Protection Class:	IEC IP67, NEMA 1,3,4,6, 13
	Temperature Rating:	-40°C to 80°C (-40°F to 176°F)
APPROVALS	NMEA:	NMEA 2000® Approved
	IEC:	IEC 61162-3

Products

PART NUMBER	DESCRIPTION
TR-NM	Mini Termination Resistor (Male)
TR-NF	Mini Termination Resistor (Female)
TRL-NM	Mini Termination Resistor with LED (Male)
TRL-NF	Mini Termination Resistor with LED (Female)

Mini 90° Male to Female Connector



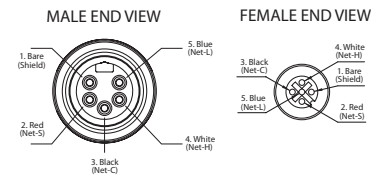
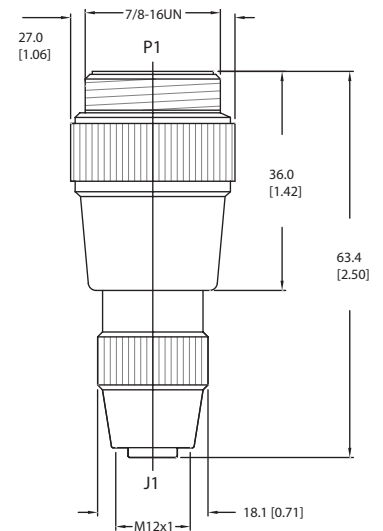
Specifications

MECHANICAL	Molded Body Mat/Color:	Thermoplastic PUR/Blue
	Contact Carrier Mat/Color:	Thermoplastic PUR/Blue
ELECTRICAL	Rated Current:	9.0 Amps
	Rated Voltage:	600 V
ENVIRONMENTAL	Protection Class:	IEC IP67, NEMA 1,3,4,6 P
	Temperature Range:	-40°C TO 80°C (-40°F to 176°F)
APPROVALS	NMEA:	NMEA 2000® Approved
	IEC:	IEC 61162-3

Products

PART NUMBER	DESCRIPTION
ELB-NM-NF	Mini 90° Male to Female Connector

Mini Male to Micro Female Reducer



Specifications

MECHANICAL	Contact Mat/Plating:	Brass/Gold
	Coupling Nut Mat/Plating:	Brass/Nickel
ELECTRICAL	Rated Current:	4.0 Amps
	Rated Voltage:	250 V
ENVIRONMENTAL	Protection Class:	IEC IP67, NEMA 1,3,4
	Temperature Range:	-40°C TO 75°C (-40°F to 167°F)
APPROVALS	NMEA:	NMEA 2000® APPROVED
	IEC:	IEC 61162-3

Products

PART NUMBER	DESCRIPTION
NM-CF	Mini Male to Micro Female Reducer

Mini Gender Changers (Male/Male)(Female/Female)



Maretron cables have a male connector on one end and a female connector on the other end. 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
- Easily swap connector gender to get back to desired connector type

Mini Bulkhead Feed-Thru



The Bulkhead Feed-Thru allows ease of installation through panels or bulkheads and establishes future connection points in a network installation. The bulkhead feed-thru also maintains the integrity of watertight bulkheads by providing a waterproof seal and connection.

- Features rugged keyways for positive alignment of connections
- Waterproof rated to IP67

N2KMeter

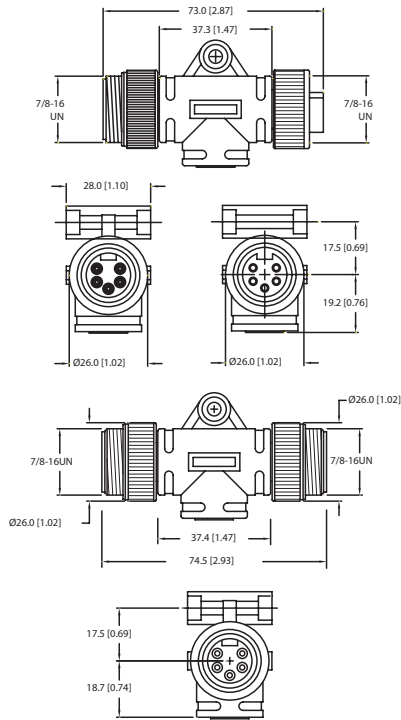


The N2KMeter enables trained and untrained personnel to diagnose and trouble-shoot network installations quickly and easily. Completely passive on the network, the meter analyzes both data and power lines on the network. In seconds, both network-wide and device-specific traffic as well as power monitoring information is captured and displayed on a simple user interface.

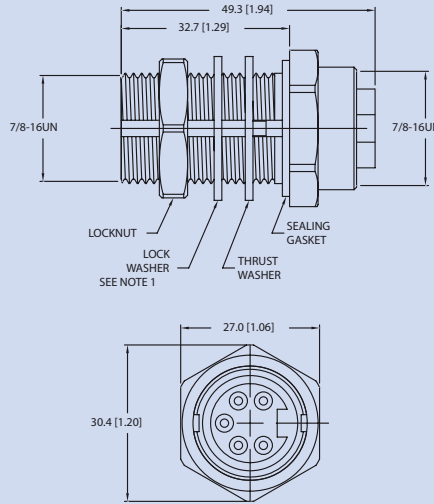
- Diagnostic tool for NMEA 2000® networks
- Evaluates physical layer device functions on a network
- Data at boat can be locked in and then evaluated later on bench

Copyright 2009 Maretron, LLP. All rights reserved. As Maretron is constantly improving its products, all specifications are subject to change without notice. Maretron's products are designed to be accurate and reliable; however, they should be used only as aids to navigation and vessel monitoring, and not as a replacement for traditional navigation and vessel monitoring techniques. A prudent captain or navigator never relies on a single source for navigation or system monitoring information. "NMEA 2000" is a registered trademark of the National Marine Electronics Association.

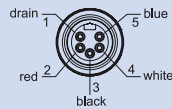
Mini Gender Changers



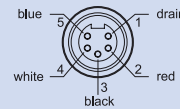
Mini Bulkhead Feed-Thru



MALE END VIEW



FEMALE END VIEW



Specifications

MECHANICAL	Molded Body Mat/Color: Thermoplastic PUR/Blue-Gray Contact Carrier Mat/Color: Thermoplastic PUR/Blue-Gray Contact Mat/Plating: Brass/Gold Coupling Nut Mat/Plating: Brass/Nickel
ELECTRICAL	Rated Current: 9.0 Amps Rated Voltage: 600 V
ENVIRONMENTAL	Protection Class: IEC IP67, NEMA 1,3,4,6P – NM-NM IEC IP67, NEMA 1,3,4,13 – NF-NF Temperature Range: -40°C to 70°C (-40°F to 158°F) – NM-NM -40°C to 55°C (-40°F to 131°F) – NF-NF
APPROVALS	NMEA: NMEA 2000® Approved IEC: IEC 61162-3

Products

PART NUMBER	DESCRIPTION
NM-NM	Mini Gender Changer (Male/Male)
NF-NF	Mini Gender Changer (Female/Female)

Specifications

MECHANICAL	Contact Carrier Mat/Color: Thermoplastic PUR/Blue-Gray Housing Mat/Plating: Brass/Nickel Contact Mat/Plating: Brass/Gold Gasket Material: Nitrile (Buna N) Accommodates Wall (thick): .040" (1.0 mm) to .875" (22.2 mm)
ELECTRICAL	Voltage Rating: 600 V Max Amperage: 9.0 Amps 5x22 AWG (0.65mm)
ENVIRONMENTAL	Protection Class: IEC IP67 Temperature Range: -40°C to 105°C (-40°F to 221°F)
APPROVALS	NMEA: NMEA 2000® Approved IEC: IEC 61162-3

Products

PART NUMBER	DESCRIPTION
BHF-NM-NF	Mini Bulkhead Feed-Thru

N2KMeter

Electrician Mode (Simple)

1. Plug in and set N2KMeter rotary switch to "autosearch"

2. Identify network health
- Happy face = healthy 😊
 - Neutral face = nominal 😐
 - Sad face = faulty 😞

3. Scroll through faults. Refer to user manual to link these faults to most likely network problems or freeze and lock settings for review back at the shop by an NMEA 2000® expert.



Expert Mode (Advanced)

1. Scroll through NMEA 2000® parameters for each active NMEA 2000® node (mac id)

- Communication errors (rate, cumulative #)
- Bandwidth (% of full usage)
- Power supply and shield voltages
- Data bit quality (dominant, recessive, +, -, differential voltage, cmv)

2. Check values (both numeric and icons)

- Happy face = within spec 😊
- Neutral face = very close to limit 😐
- Sad face = out of limit 😞

3. Refer to user manual to link these faults to most likely network problems

Specifications

MECHANICAL	Power Supply: Network 7 - 30v DC < 90MA Batteries 2 X AA Alkaline Batteries 6 Hours Of Operation Approx. 1 Year Data Retention
Connectors: Micro Connector	Band Rates: 125k, 250k and 500k (Auto-detect)
Analogue Accuracy: Bus Power ±100mV, Bus Signal ±20mV	Analogue Range: Bus Power 0 to 25v with over/under Range Indication Bus signal -5 To 10v with over/under range Indication
Analogue Sample Rate: Bus Power 1 Khz Bus Signal Ideal Sample Pt: 250ns	Signal Error Threshold: NMEA 2000® Spec for Network Power
Bus Load Measurement: Detects Bus Idle In Real Time	Bus Message Rate Measurement: Detects 100% of Individual Can Frames in Real Time
Error Rate Measurement: Detects 100% of Individual Error Frames in Real Time	
APPROVALS	NMEA: NMEA 2000® Approved

Products

PART NUMBER	DESCRIPTION
N2KMETER-01	Diagnostic Meter w/1m Micro Cordset

Maretron NMEA 2000® Network Installation Guide

Installing an NMEA 2000® Network

Installing an NMEA 2000® network consists of inter-connecting NMEA 2000® electronic devices using plug-and-play cables and connectors. The following pages provide a brief description of how to setup a NMEA 2000® network using five basic steps:

1. Cable and Connector Network Basics
2. Installing Terminators
3. Supplying Power
4. Grounding the Network
5. Checking the Network

Please note that this installation guide contains a brief description of the basic concepts of installing an NMEA 2000® network and Maretron suggests that you consult a trained professional for any installation. You can learn more about installing NMEA 2000® networks by contacting the National Marine Electronics Association (NMEA) at www.nmea.org and consulting the following documents:

- NMEA 2000® Standard for Serial-Data Networking of Marine Electronic Devices
- NMEA Installation Standards

1. Cable and Connector Network Basics

1.1 Network Topology

The NMEA 2000® cable system uses a trunk (sometimes referred to as the backbone) and drop line topology as shown in Figure 1.

The NMEA 2000® cable system includes five wires within a single waterproof cable: two signal wires, power and ground wires, and a drain wire. The drain wire shields the signal, power, and ground wires from external Radio Frequency Interference (RFI) and helps reduce RFI emission from the cable.

You can connect devices using one of three cable options:

Mini - This is commonly used for the trunk line on the network because of its greater current carrying capacity (8 amps) as

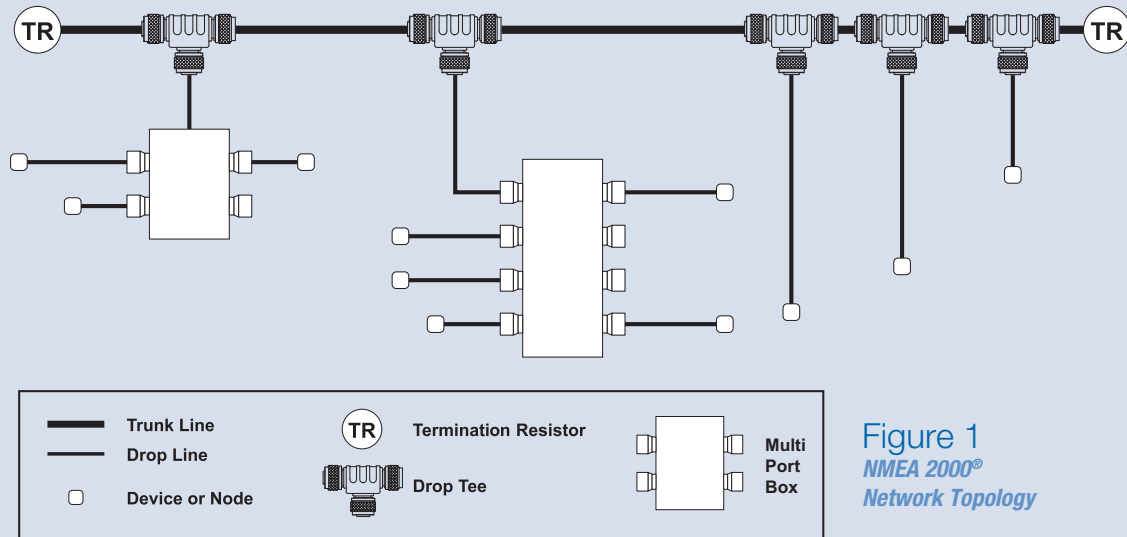
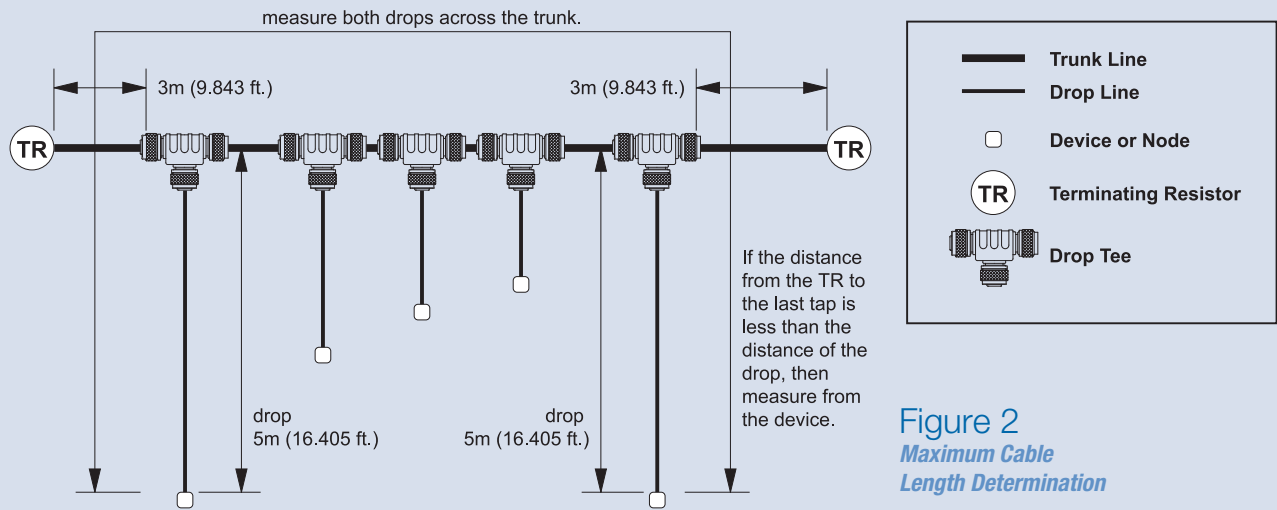


Figure 1
NMEA 2000®
Network Topology



opposed to Micro cable (4 amps). Mini cable has an outside diameter in the range from 0.41 to 0.49 inches. Its maximum installed bend radius is 7x the cable diameter. You can also use this type of cable for drop lines.

Mid - This is commonly used for smaller networks as either the network trunk line or as drop lines. Mid cable and connectors are rated to 4 amps just like the Micro cable, however the larger diameter power conductors within the Mid cable provides for less voltage drop over Micro cable, especially for long runs. The diameter of the Mid cable is 0.33 inches.

Micro - This cable type is typically used as the drop line connecting devices to the main trunk line with an outside diameter in the range from 0.24 to 0.28 inches. Micro cable has a smaller diameter and is more flexible than mini cable with an installation bend radius of 7x the cable diameter. Smaller networks use this type of cable for both the trunk and drop lines.

You construct the trunk line using double-ended cordsets connected between tees or taps. One end of the cordset has a male connector with male pins while the other end of the cordset has a female connector and female receptacles. The connectors are keyed so they can only connect to each other in one way. As an alternative to double-ended

cordsets, you can make your own trunk line using bulk cable and field-attachable connectors. If you decide to add equipment later, you can simply disconnect a cordset from a tee, add another tee directly to the existing tee, re-connect the cordset and add the new component to the system using a drop cable. Alternatively, you could cut the trunk line, add two field-attachable connectors and insert a new tee. Trunk lines can also be run up to watertight bulkheads and connected to a waterproof bulkhead feed-thru connector to maintain the integrity of watertight compartments.

To drop off the trunk line, you connect a device using a tee connector. Daisy chaining of devices is not allowed, as it is a requirement to be able to remove a component from the network without affecting any other device. This allows you to remove a device for servicing while the rest of the network remains operational. Multi port boxes are also available where instruments tend to be clustered, around the helm for example.

1.2 Maximum Cable Distance

The cable distance between any two points (a point being an electronic product or terminator) must not exceed 250 meters (820 feet) for a system based on the Mini or Mid trunk cable or 100 meters (328 feet) for a system based on a Micro trunk cable.

For most cases, the maximum distance should be measured between termination resistors. However, if the distance from a trunk line tee to the farthest device connected to the trunk line is greater than the distance from the tee to the nearest terminating resistor (TR), then you MUST include the drop line length as part of the cable length in your maximum cable distance calculation. Figure 2 shows an example where both 5 meter drops must be included in the maximum cable distance since the drops are longer than the distance from the tee to termination resistor.

1.3 Cumulative Drop Line Length

The cumulative drop line length refers to the sum of all drop lines, Mini, Mid or Micro cable in the cabling system. This sum cannot exceed 78 meters (256 feet). Figure 3 shows an example using four drop tees and two multiport drops to attach 11 devices to the trunk line. The cumulative drop line length is 37 meters (122 feet) and no single device is more than 6 meters (20 feet) from the trunk line.

1.4 Maximum Drop Line Length

The maximum cable distance from any device on a branching

drop line to the trunk line is 6 meters (20 feet).

1.5 Maximum Number of Devices

A maximum of 50 physical devices shall be connected to the network, and the disconnection of any device shall not interrupt any other device on the network.

1.6 NMEA 2000® Cable

The Mini, Mid and Micro cables contain five wires: One twisted pair (red and black) for 12VDC power, one twisted pair (blue and white) for signal and a drain wire (bare).

The following table shows the color, name, and usage for each wire contained within the cable.

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

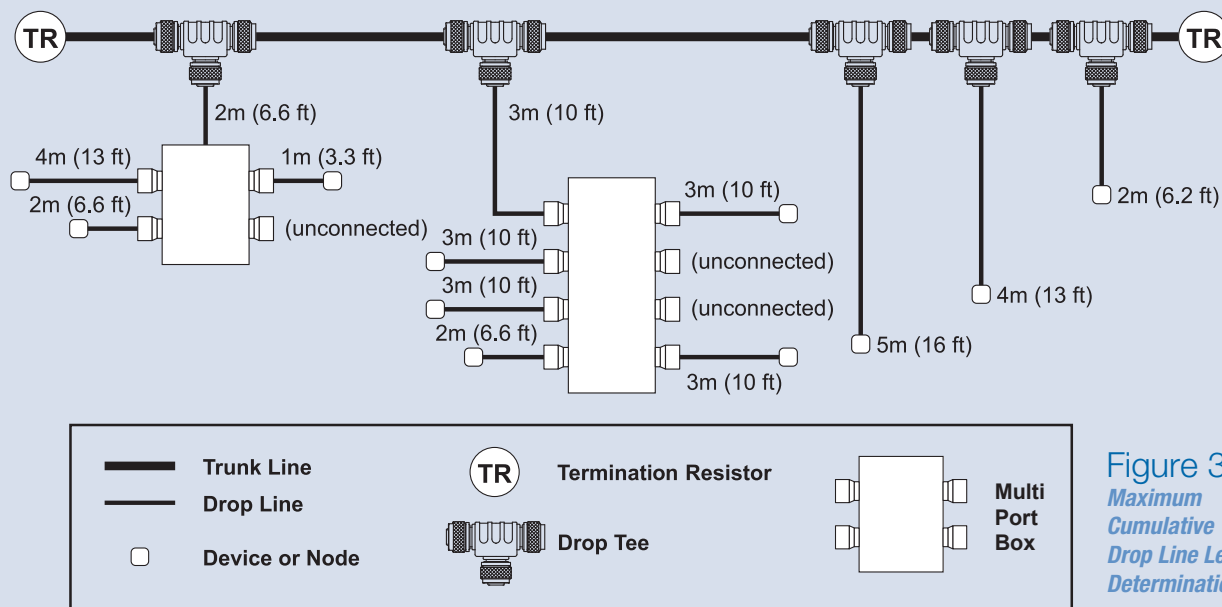
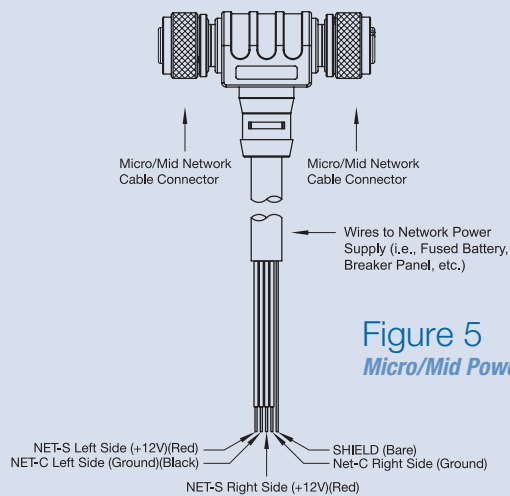
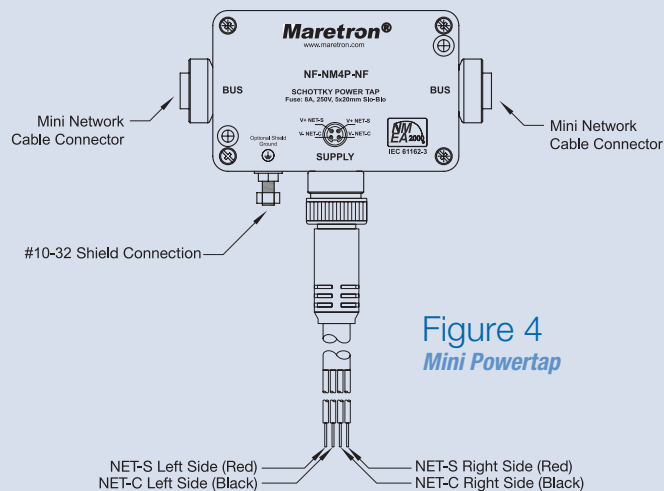
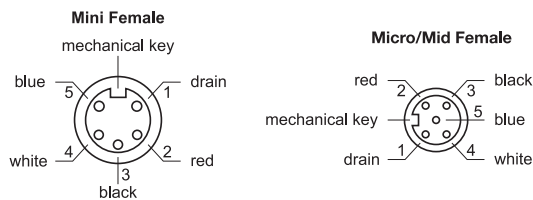


Figure 3
Maximum
Cumulative
Drop Line Length
Determination



1.7 NMEA 2000® Connectors

Connectors attach cables to devices or other components of the NMEA 2000® cable system. This allows the network to be completely “plug-and-play”. Connections can be made with pre-molded cordsets or with field-attachable connectors. The following diagram shows the pins found within Mini connector and the Micro and Mid connector and the corresponding wire colors for those pins.



2. Installing Terminators

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

3. Supplying Power

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. For the purpose of this installation guide, we will focus on the power source being a single-point connection to the vessel’s battery. Over current protection should be provided and should be sized in accordance with ABYC E-11, AC and DC ELECTRICAL SYSTEMS ON BOATS, taking into consideration the smallest gauge of cable being used for the backbone or drop cables. The NET-S wire is connected to the positive side of the battery while NET-C is connected to the negative side of the battery.

3.1 Mini Power Connection

Power is supplied to a Mini trunk line via a Powertap that is shown in Figure 4. Note that the Mini power cable does not have a shield wire as this connection is made to the screw terminal on the Powertap itself.

3.2 Mini Power Capability

Although Mini cable is rated to 8 amps, the cable system can support a total load of more than 8 amps. For example, 16 amps of power could be supplied to the middle of the trunk where 8 amps is supplied to both sides of the power tap. The

Powertap can handle large loads as long as no more than 8 amps is drawn through any single segment of the trunk line. However, cable resistance may limit your application to less than 8 amps.

3.3 Micro/Mid Power Connection

Like the Mini power connection, power is supplied to a Micro/Mid trunk line via a Powertap, which is shown in Figure 5.

3.4 Micro/Mid Power Capability

Micro/Mid cable is rated to 4 amps but like Mini cable, strategic placement of the power source could support higher current. For example, 8 amps of power could be supplied to the middle of the trunk where 4 amps is supplied to both sides of the power tap. It can handle large loads as long as no more than 4 amps is drawn through any single segment of the trunk line. However, cable resistance may limit your application to less than 4 amps

3.5 End-Powered Network

End-powered networks are typically seen on smaller vessels with only a few NMEA 2000® devices. Figure 6 shows an end-powered network.

3.6 Middle-Powered Network

A middle-powered network is typically found on larger vessels and is any network where the power is connected to the network at some location other than at the end. This

network consists of two legs, one leg extending in each direction from the power insertion point. Figure 7 shows a middle-powered network.

3.7 Maximum Power Supply Voltage Drop

The NMEA 2000® network is designed to work properly as long as there is no more than a 1.5 volt difference in the power supply voltage between any two devices on the network. Therefore, you should perform an estimate of the voltage drop across a network using the following equation:

$$\text{Voltage Drop} = 0.1 \times \text{Network Loads} \times \text{Network Length} \times \text{Cable Resistance}/100$$

Where: Network Loads is sum of Load Equivalent Numbers (LEN) for all devices (see device nameplate)
 Network Length is in meters
 Cable resistance is in ohms/100 meters
 (see pages 1 and 9 specifications)

Power supply voltage drop estimates resulting in less than 1.5 volts across the entire network require no further analysis. Likewise, estimates ranging between 1.5 and 3.0 volts require no further analysis as long as a mid-powered network is used. Occasionally, estimated power supply voltage drops will occur outside these limits and will require further consideration through detailed calculations by certified technicians.

4. Ground the Network

The NMEA 2000® network should be grounded at ONE

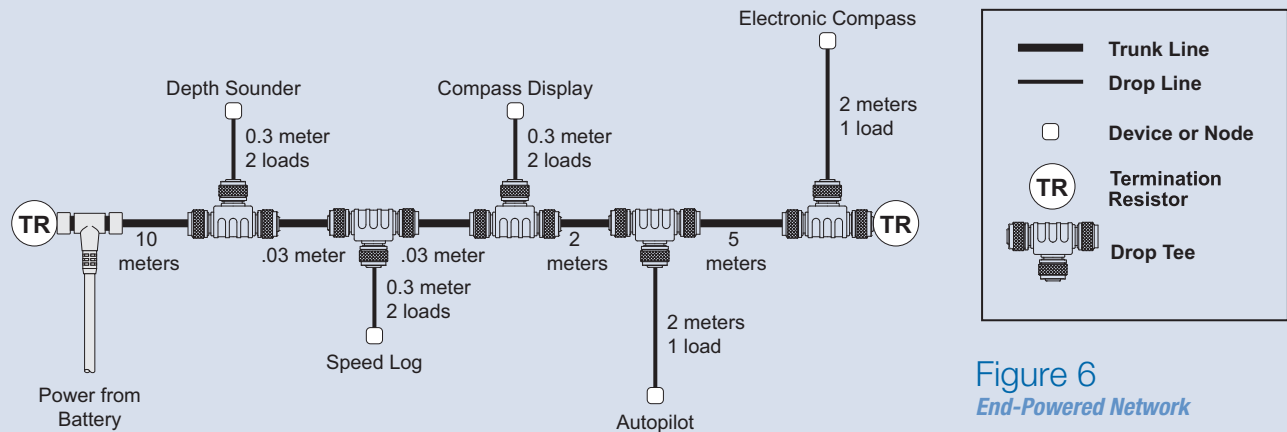


Figure 6
End-Powered Network

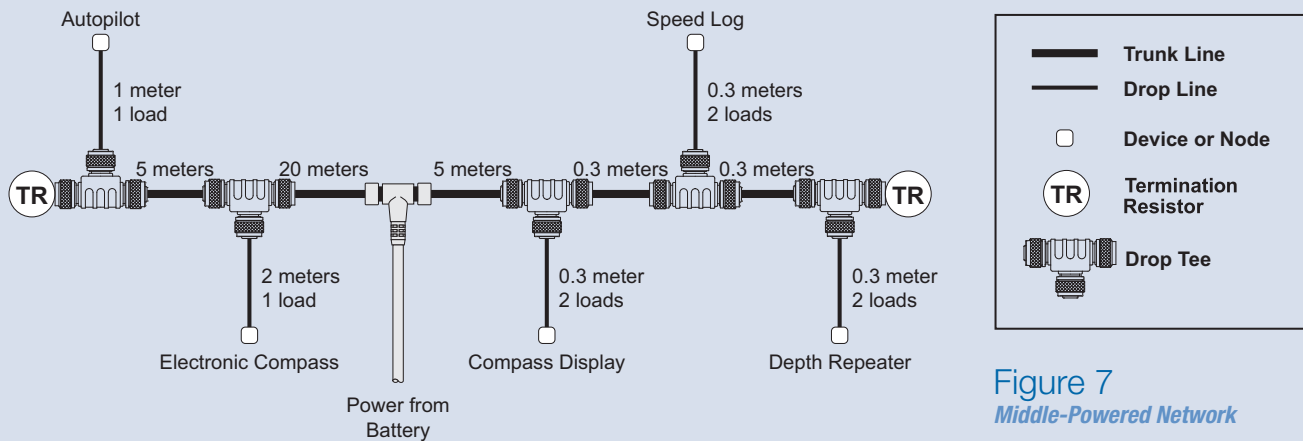


Figure 7
Middle-Powered Network

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.

5. Checking Your Network

Verify that the network has been correctly designed and installed by reviewing the following checklist:

- Number of devices does not exceed 50
- Maximum Mini cable distance between any two devices does not exceed 200 meters (656 feet)
- Maximum Micro/Mid cable distance between any two devices does not exceed 100 meters (328 feet)
- Maximum cumulative drop line length does not exceed 78 meters (256 feet)
- No drop should be greater than 6 meters (20 feet)
- Termination resistors are installed on both ends of the trunk
- The network is grounded at a single location
- The SHIELD wire is connected to a single point, the supply ground

If you are having difficulties with the network make sure to check the following most common network problems:

- More or less than two terminating resistors
- Loose connections, make sure that all connectors are securely fastened
- Excessive trunk line length-especially with Micro cable
- Excessive drop line cable length
- Improper shield and ground connection at the power supply
- Shorts and opens in field-attachable connectors
- Failure to perform power distribution calculations for new installations and when adding new devices
- Using a typical device current rather than maximum current for power distribution calculations

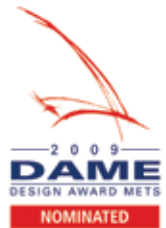
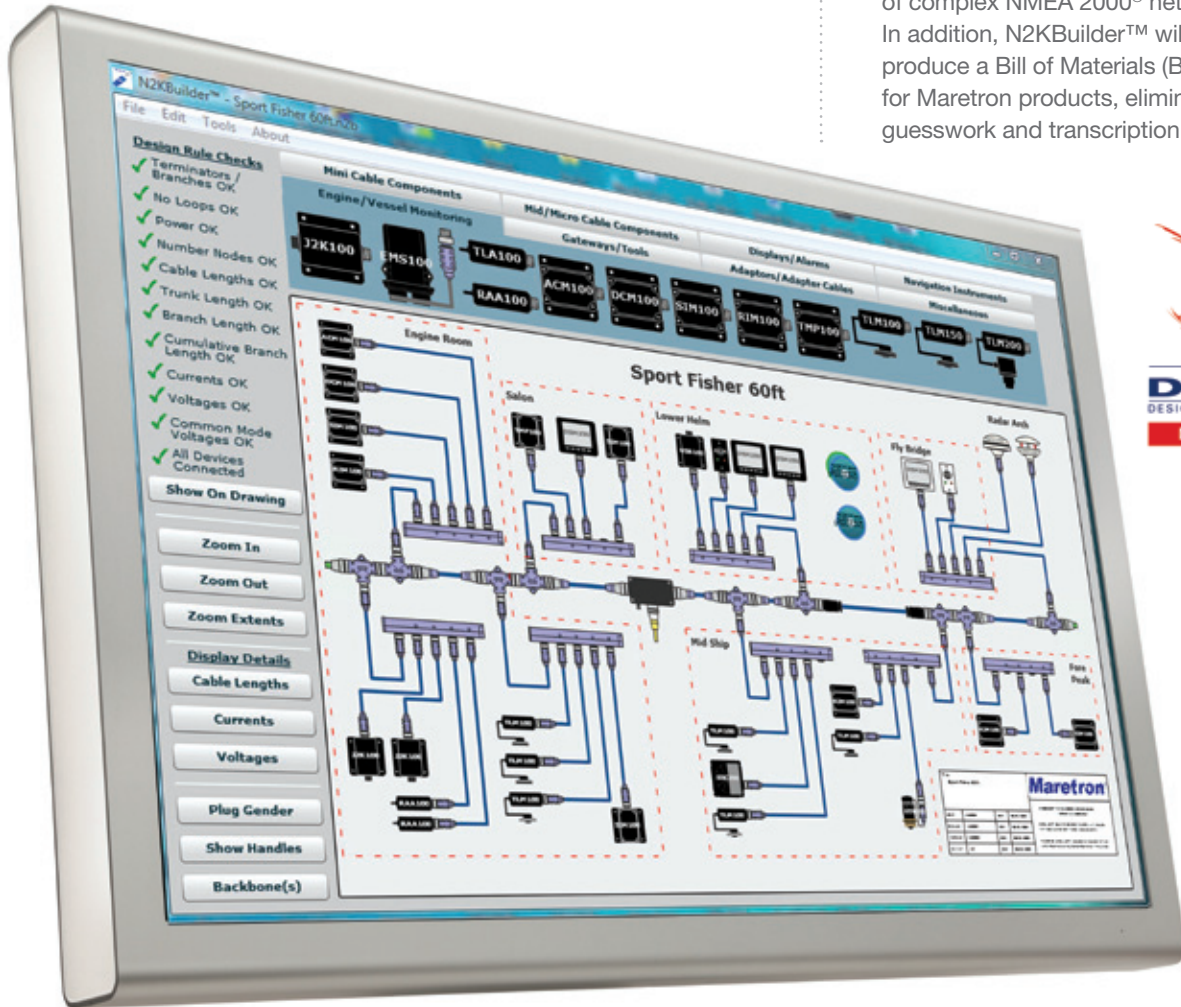
In order to insure the proper installation and configuration of an NMEA 2000® network, it is a good idea to have available at least one N2KMeter. The N2KMeter greatly simplifies network diagnostics and can detect many fault conditions including:

- Opens and shorts
- Incorrect topology
- Bad nodes
- Bad termination
- Improper shield connection
- Intermittent problems
- Excessive scan rate
- Common mode voltage

N2KBuilder™

NMEA 2000® Network Design Software

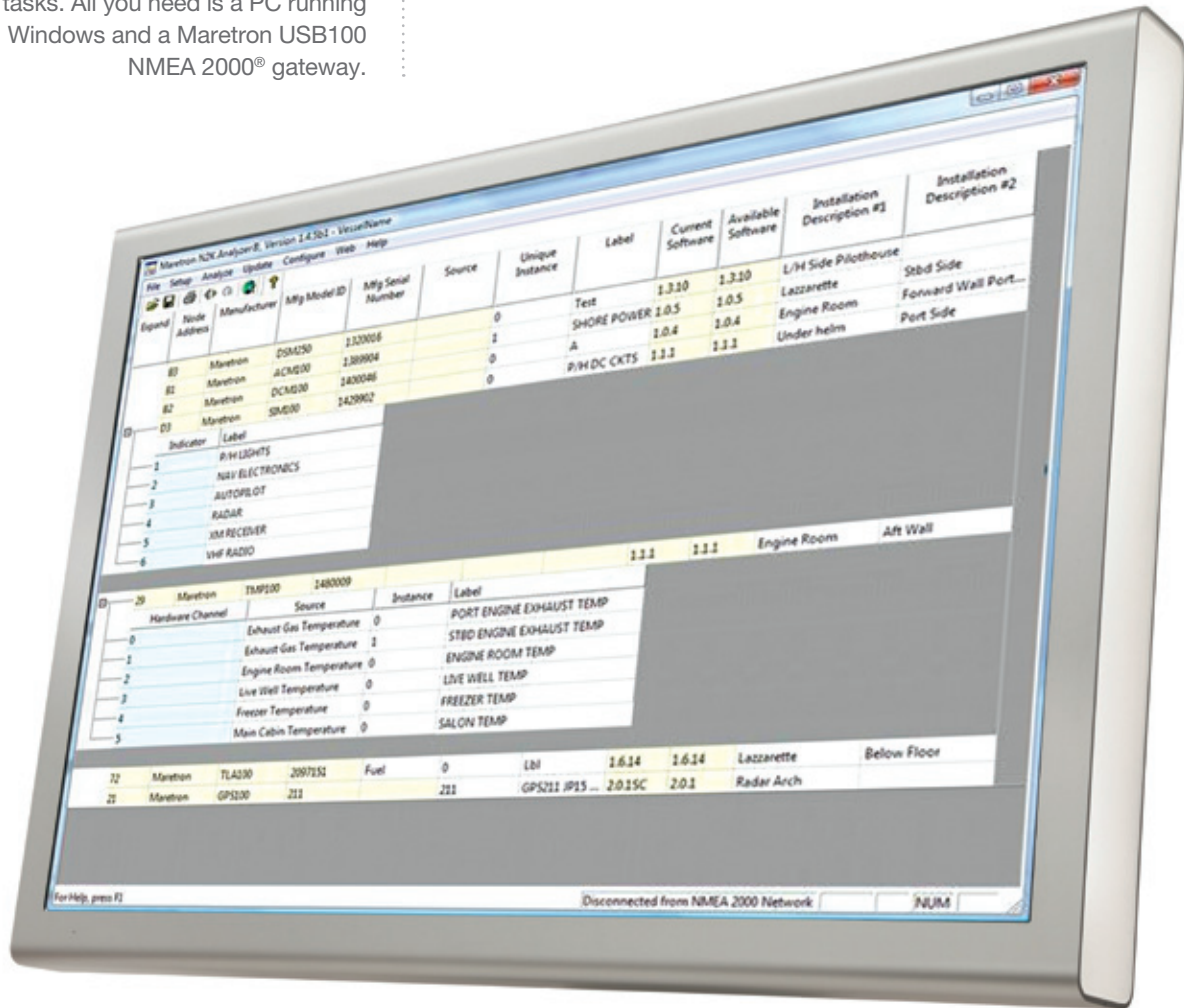
N2KBuilder™ software is a powerful, free PC-based tool for designing and verifying the integrity of NMEA 2000® networks. The N2KBuilder™ software, when installed on a Windows PC and used as part of an integrated design workflow can be used to plan, document, and validate the design of complex NMEA 2000® networks. In addition, N2KBuilder™ will directly produce a Bill of Materials (BOM) for Maretron products, eliminating guesswork and transcription errors.



N2KAnalyzer® is a software tool, currently offered free of charge with the purchase of a USB100 NMEA 2000®/USB gateway, which gives you a detailed view of all of the devices on a NMEA 2000® network, and lets you perform an enormous variety of configuration and troubleshooting tasks. All you need is a PC running Windows and a Maretron USB100 NMEA 2000® gateway.

N2KAnalyzer®

NMEA 2000® Network Analysis Software





10

Maretron Corporate Office

9014 N. 23rd Avenue, Suite 10

Phoenix, AZ 85021

Toll Free: 866-550-9100

Phone: 602-861-1707

Fax: 602-861-1777

Email: sales@maretron.com

Web: www.maretron.com

www.maretron.com

Maretron®

Leading the way in NMEA 2000® technology