# ICOM

# MARINE PRODUCTS
## 2017 *Simply the Best.*

## World's Slimmest Floating DSC Radio

### VHF MARINE TRANSCEIVER with DSC
## IC-M93D

**Included Accessories**
- Battery pack, BP-285
- Battery charger, BC-220
- AC adapter, BC-123SA/SE*
- Belt clip, MB-133
- Antenna, FA-SC59V
- Cigarette lighter cable, CP-25H
- Hand strap
- * Depending on version.

Feature icons: LARGE LCD | SLIM BODY 38.5 mm | INTUITIVE UI | BUILT-IN CLASS D DSC (DISTRESS) | FLOAT'n FLASH | INTEGRATED GNSS RECEIVER | ACTIVE NOISE CANCEL | IPX7 SUBMERSIBLE | 900mW LOUD AUDIO | 5W OUTPUT POWER

### FEATURES

- **2.3" large high visibility LCD**
- **Slimmest\* floating DSC radio**
- **Intuitive user interface**
- **Built-in class D DSC with a CH70 receiver**
- **Float'n flash and MOB auto set function**
- **Integrated GNSS receiver**
- **Active noise canceling**

*As of December 2016, researched by Icom.

• IPX7 submersible • Navigation function • 50 waypoint memories • Weather alert function • Dual watch and Tri-watch functions • Favorite channel function • Aqua-Quake™ draining function • Optional speaker-micro-phones, HM-228/HM-165

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## 1.5 m Submersible, 6 W VHF with Professional Features

### VHF MARINE TRANSCEIVERS
## IC-M73 PLUS
## IC-M73

**Included Accessories**
- Battery pack, BP-245H
- Battery charger, BC-210
- AC adapter, BC-123SA/SE*
- Belt clip, MB-103
- Antenna, FA-S59V or FA-S64V*
- Cigarette lighter cable, CP-25H
- Hand strap
- * Depending on version
- Photo shows FA-S59V antenna version.

Feature icons: VOICE RECORDING (PLUS) | ACTIVE NOISE CANCEL (PLUS) | BASS BOOST FUNCTION (PLUS) | IPX8 SUBMERSIBLE PLUS | SLIM HOURGLASS BODY | 700mW LOUD AUDIO | 6W OUTPUT POWER

### FEATURES

- **Last call voice recording\*** (PLUS)
- **Active noise canceling\*** (PLUS)
- **Bass Boost function\*** (PLUS)
- **IPX8 Submersible Plus™ (1.5 m/ 30 min.)**
- **6W RF output, 700mW loud audio**
- **17 hours of long lasting operating time with BP-245H**

*(PLUS) Available in IC-M73 PLUS version only.

• Dual watch and Tri-watch functions • Instant access to Ch 16 and call channel • Weather alert functions (USA version only) • AquaQuake™ draining function • Auto power save • Priority and normal scan • Tag scan and favorite channel function • Optional speaker-microphones, HM-167/HM-202

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## New Style! Three Color Choices Smart, Fast USB Charging

### VHF MARINE TRANSCEIVER
## IC-M25

Metallic Gray    Pearl White

Marine Blue

**Included Accessories**
- USB charger, BC-217SA/SE*
- Belt clip, MB-133
- Antenna, FA-SC59V
- Hand strap
- Battery cell is built-in
- * Depending on version

Feature icons: EASY TO USE ENTRY MODEL | FLOAT'n FLASH | IPX7 SUBMERSIBLE | SLIM AND LIGHTWEIGHT | 550mW LOUD AUDIO | 5W OUTPUT POWER | MICRO-B USB CHARGING

### FEATURES

- **Slim body, lightweight and high performance**
- **Large LCD and intuitive user interface**
- **Micro-B USB charging**
- **Floating with blinking red LED light**
- **11 hours of long operating time**
- **5W RF output, 550mW clear audio**

• IPX7 submersible protection • Dual watch and Tri-watch functions • Instant access to Ch 16 and call channel • Weather alert function (USA version only) • AquaQuake™ draining function • 2-step power save • Auto scan function • Tag scan and favorite channel function • Built-in 3 hours rapid charger (with BC-217SA/SE*) • Optional speaker-micro-phone, HM-213   * Depending on version

## Clear Voice Boost and it Floats!

**Included Accessories**
- Battery pack, BP-252
- Battery charger, BC-173
- AC adapter, BC-147SA/SE*
- Belt clip, MB-109
- Antenna, FA-SC58V
- Hand strap
- * Depending on version

### VHF MARINE TRANSCEIVER
# IC-M36

**EASY TO USE** ENTRY MODEL | **FLOATING** | **IPX7 SUBMERSIBLE** | **NOISE CANCEL** | **700mW LOUD AUDIO**

**6w OUTPUT POWER**

### FEATURES

- **Floating radio, even with HM-165**
- **Noise canceling microphone**
- **Automatic volume adjustment**
- **Volume boost and mute functions**
- **Large buttons and easy to grip**
- **6W RF output, 700mW loud audio**

• Dual watch and Tri-watch functions • Instant access to Ch 16 and Ch 9 • Weather alert functions (USA version only) • AquaQuake™ draining function • 2-step power save • Auto scan function • Tag scan and favorite channel function • Optional speaker-microphone, HM-165

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## Compact Size for Commercial or Recreational Use

**Included Accessories**
- Battery pack, BP-227/BP-274*
- Battery charger, BC-152N
- AC adapter, BC-147SA/SE*
- Belt clip, MB-86
- Antenna, FA-S59V
- Hand strap
- * Depending on version.

### VHF MARINE TRANSCEIVER
# IC-M88

**PRO** PROFESSIONAL MODEL | **IPX7 SUBMERSIBLE** | **SMALL AND LIGHTWEIGHT** | **LAND MOBILE CHANNEL PROGRAMMABLE** | **5w OUTPUT POWER**

### FEATURES

- **Tough and submersible compact body**
- **Marine and land channel groups**
- **22 programmable land channels**
- **Built-in CTCSS and DTCS tones**

• Dual watch and Tri-watch functions • Instant access to Ch 16 and Ch 9 • Weather alert functions (USA version only) • Auto power save • Auto scan function •Tag scan function • Optional speaker-microphones, HM-168/HM-138

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## 5 W Output Power for Hazardous Locations

**Included Accessories**
- Battery pack, BP-227UL
- Battery charger, BC-152N
- AC adapter, BC-147SA
- Belt clip, MB-86
- Antenna, FA-S59V
- Hand strap

### VHF MARINE TRANSCEIVER
# IC-M88 UL Version

**HAZARDOUS LOCATIONS** | **IPX7 SUBMERSIBLE** | **SMALL AND LIGHTWEIGHT** | **LAND MOBILE CHANNEL PROGRAMMABLE** | **5w OUTPUT POWER**

### FEATURES

- **Nonincendive: Class I, Division 2, Groups A, B, C, D T6 (≤85°C)**
- **Tough and compact body**
- **Marine and land channel groups**
- **22 programmable land channels**

• Built-in CTCSS and DTCS tones • Dual watch and Tri-watch functions • Instant access to Ch 16 and call channel • Auto power save • Auto scan function • Tag scan function • Built-in voice scrambler (Depending on version) • Optional speaker-microphone, HM-168IS

DO NOT use the transceiver with any other equipment not specified in the option list (Pages 13–14). Please ask your dealer to ensure the rating is acceptable for the intended place of use.
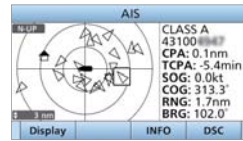
# Premium Grade Modern Fixed Mount Radio
# Class D DSC, AIS Receiver and Remote Control

AIS plotter

AIS target list

Night mode

## VHF MARINE TRANSCEIVER
# IC-M605

4.3-INCH COLOR TFT DISPLAY | COMMAND HEAD | COMMANDMIC™ | INTEGRATED AIS RECEIVER

NMEA 2000 | RECEIVER PERFORMANCE | ACTIVE NOISE CANCEL | VOICE RECORDING

30W TWO-WAY HAILER & FOGHORN | 25w OUTPUT POWER | GNSS INTEGRATED GNSS RECEIVER | BUILT-IN CLASS D DSC DISTRESS

IPX8 SUBMERSIBLE PLUS | MARINECOMMANDER COMPATIBLE | MA-500TR COMPATIBLE

## FEATURES

- Wide viewing angle, high contrast 4.3 inch color TFT LCD
- Remote control with up to three COMMAND HEAD/COMMANDMIC™
- Integrated AIS receiver* • Built-in Class D DSC
- NMEA 2000™ connectivity • Intuitive user interface
- Class leading receiver performance (Selectivity and IMD: more than 80 dB)
- Active noise canceling • Last call voice recording for two minutes
- 30 W two-way hailer • Optional horn speaker, SP-37
- Integrated GNSS receiver (GPS, GLONASS and SBAS), 5 m cable and antenna supplied

• NMEA 0183-HS (High Speed) Version 1.01 connectivity (38.4 kbps) • IPX8 submersible plus (1m depth water for 60 minutes) • DSC multi-task function • RX hailer and automatic foghorn functions • Dual watch and Tri-watch functions • Instant access to Ch 16 and Call channel • Tag scan and favorite channel functions • AquaQuake™ draining function • Priority scan function • Display and keypad backlighting • External speaker connection • Optional voice scrambler, UT-112

*AIS receiver unit is an option, depending on version.

## Flexible Remote Controll Configurations

The IC-M605 can be remotely controlled with up to three COMMAND HEAD/COMMAND-MIC™. The COMMAND HEAD provides an identical operation with the IC-M605 and the COMMANDMIC™ allows you to use all functions including distress of the IC-M605. The intercom function among the IC-M605, COMMAND HEAD and COMMANDMIC™ is convenient for internal conversation.

**Installation Example**

Flybridge

Cockpit

HM-195 series

IC-M605

Office corner

Engine room

RC-M600
Identically controls the IC-M605 from up to 50 m (164 ft).

HM-195 series
Saves space and fully controls the IC-M605 from up to 18.3 m (60 ft).
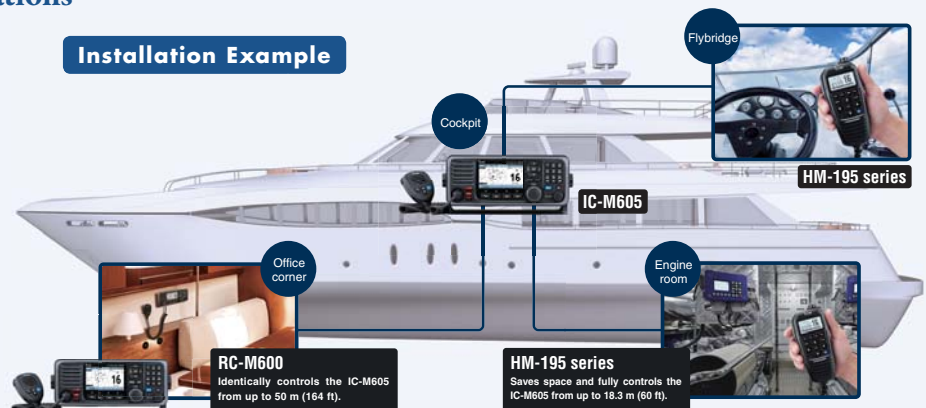
## Identical Operation from Optional Full-sized Controller

### COMMAND HEAD
# RC-M600

OPTION FOR IC-M605 | 4.3-INCH COLOR TFT DISPLAY | IPX8 SUBMERSIBLE PLUS

## Space-Saving Compact Body

COMMANDMIC™
# HM-195GB/GW
(White Backlight LCD)
# HM-195B/SW
(Amber Backlight LCD)

OPTION FOR IC-M605, M506, M424G | IPX7 SUBMERSIBLE

* Photo shows HM-195GB.

# VHF Fixed Mount Transceivers

## VHF and AIS Receiver Combo with NMEA 2000™ Connectivity

**VHF MARINE TRANSCEIVER**

# IC-M506

Icons: INTEGRATED AIS RECEIVER · NMEA 2000 · VOICE RECORDING · ACTIVE NOISE CANCEL · 15W 15W LOUD AUDIO · 25W TWO-WAY HAILER · COMMANDMIC™ · 25W OUTPUT POWER · DISTRESS BUILT-IN CLASS D DSC · IPX8 SUBMERSIBLE PLUS · MARINECOMMANDER COMPATIBLE · MA-500TR COMPATIBLE

### FEATURES

- Integrated AIS receiver*
- NMEA 2000™ connectivity*
- 2 minutes Last Call voice recording
- Intuitive user interface
- Active noise canceling
- 15 W loud audio and 25 W two-way hailer
- Optional COMMANDMIC™, HM-195 series
- IPX8 Submersible Plus™ (1m depth for 60 minutes)

\* AIS receiver, NMEA 2000™ interface units are options, depending on version.

• Dual watch and Tri-watch functions • Instant access to Ch 16 and Call channel • Weather alert functions (USA version only) • Tag scan and favorite channel functions • AquaQuake™ draining function • Auto scan function • Display and keypad backlighting • External speaker connection • Option voice scrambler UT-112 • Large dot-matrix display • Rear panel microphone version

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**VHF MARINE TRANSCEIVER**

# IC-M424G
**(With GPS Receiver)**

## Easy-to-Use and Even Easier to Hear

Icons: ACTIVE NOISE CANCEL · 10W 10W LOUD AUDIO PA & FOGHORN · COMMANDMIC™ · DISTRESS BUILT-IN CLASS D DSC · GPS INTEGRATED GPS RECEIVER · IPX7 SUBMERSIBLE · 25W OUTPUT POWER · MARINECOMMANDER COMPATIBLE · MA-500TR COMPATIBLE

### FEATURES

- Intuitive user interface
- Active noise canceling
- 10 W loud audio, public address and foghorn
- Optional COMMANDMIC™, HM-195 series
- IPX7 submersible
- Black and Super White color versions
- Integrated GPS receiver simplifies wiring

• Dual watch and Tri-watch functions • Instant access to Ch 16 and Call channel • Weather alert functions (USA version only) • Tag scan and favorite channel functions • AquaQuake™ draining function • Auto scan function • Display and keypad backlighting • External speaker connection • RX speaker function

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**VHF MARINE TRANSCEIVER**

# IC-M400BB

## Black Box Transceiver When Space is at a Premium

Icons: SPACE-SAVING · COMMANDMIC™ · ACTIVE NOISE CANCEL · 10W 10W LOUD AUDIO PA & FOGHORN · DISTRESS BUILT-IN CLASS D DSC · IPX7 SUBMERSIBLE · 25W OUTPUT POWER · MARINECOMMANDER COMPATIBLE · MA-500TR COMPATIBLE
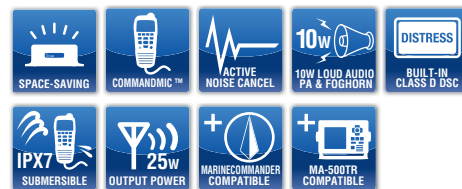
IC-M400BB and HM-195B

### FEATURES

- Space-saving, fully functional VHF/DSC
- Controlled by COMMANDMIC™ HM-195 series*
- Intuitive user interface
- Active noise canceling
- 10W loud audio, public address and foghorn
- IPX7 submersible (Both IC-M400BB and HM-195 series)

\* HM-195 series may be sold separately, depending on version.

• Dual watch and Tri-watch functions • Instant access to Ch 16 and call channel • Weather alert functions (USA version only) • Tag scan and favorite channel functions • AquaQuake™ draining function • Auto scan function • Display and keypad backlighting • External speaker connection • RX speaker function

# VHF Fixed Mount Transceivers

## Top Performance, Great Value

### VHF MARINE TRANSCEIVER
# IC-M324G
(With GPS Receiver)

**GPS**

IC-M324G

### VHF MARINE TRANSCEIVER
# IC-M324
(Without GPS Receiver)

IC-M324

**GPS** INTEGRATED GPS RECEIVER (IC-M324G only)

**DISTRESS** BUILT-IN CLASS D DSC

**IPX7** SUBMERSIBLE

**25w** OUTPUT POWER

MARINECOMMANDER COMPATIBLE

MA-500TR COMPATIBLE

### FEATURES

- Powerful, compact VHF with Icom value and reliability
- Intuitive user interface
- High-definition dot-matrix display
- Class D DSC • Integrated GPS receiver (IC-M324G only)

• IPX7 waterproof • Dual watch and Tri-watch functions • Instant access to Ch 16 and Call channel • Tag scan and favorite channel functions • Aqua-Quake™ draining function • Auto scan function • Display and keypad backlighting • External speaker connection • Black and Super White color versions

## Affordable, Simple VHF without DSC Function

### VHF MARINE TRANSCEIVER
# IC-M200

**IPX7** SUBMERSIBLE

**4.5w** 4.5W AUDIO OUTPUT

**25w** OUTPUT POWER

### FEATURES

- Compact and IPX7 submersible body
- Large easy-to-see LCD and simple construction
- Loud audio from front mount speaker
- 25 W output power • "Made in Japan" quality

• Favorite channel function • Programmable scan function • Priority scan function • Dual watch and Tri-watch function • AquaQuake™ draining function • MIL 810G durability • 70 dB Selectivity/IMD • Keypad backlighting

**\* IC-M200 is not available in the USA.**

# AIS Transponder

## Fully Capable Class B AIS Transponder

### CLASS B AIS TRANSPONDER
# MA-500TR

**CLASS B AIS TRANSPONDER**

**IPX7** SUBMERSIBLE

**4×6 INCH** 4×6 INCH FLUSH MOUNT

**2w** OUTPUT POWER

VHF TRANSCEIVER COMPATIBLE

MARINECOMMANDER COMPATIBLE

MXG-5000S GPS receiver

### FEATURES

- Class B AIS transponder • Large full dot-matrix display
- CPA and TCPA collision-risk management
- AIS target call with Icom VHF transceiver
- 100 waypoint memories • 3-line NMEA input/output
- MXG-5000S GPS receiver*

  * The MXG-5000S may be sold separately, depending on country.

# MF/HF Marine Transceiver

## Advanced Marine SSB with Compact Remote Head

**MF/HF MARINE TRANSCEIVER**

# IC-M802

| DISTRESS | 4×8 INCH | | 150w |
|---|---|---|---|
| BUILT-IN CLASS E DSC | 4×8 INCH FLUSH MOUNT | ONE-TOUCH E-MAIL | 150W(PEP) OUTPUT POWER |

Photo shows the IC-M802 EXP version.

### FEATURES

- **Wideband receiver coverage (0.5–29.9999 MHz)**
- **Large dot-matrix display**
- **One-touch e-mail access button***
  * Depending on version. Please consult with an HF e-mail provider for details.
- **Flexible filter settings with built-in DSP**

- **Optional automatic antenna tuner, AT-140**
- **150 W (PEP) powerful output**
- **Built-in Class E DSC*** * Depending on version.
- **DIN and RS-232 connectors for external equipment**

\* IC-M802 is not available in the USA.

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## Reliable MF/HF Radio with Covering All ITU HF Marine Channels

**MF/HF MARINE TRANSCEIVER**

# IC-M710

| 150w | ABC 123 | 1136 |
|---|---|---|
| 150W(PEP) OUTPUT POWER | ALPHANUMERIC READOUT | CHANNEL |

### FEATURES

- **Alphanumeric readout for programming channel names and quick access to channels**
- **150 W* full duty operation**  • **A total of 1136 channels**
- **Rugged construction for withstanding harsh use**
  * 60 W (PEP) above 24 MHz bands.

• Programmed scan, channel scan and channel resume scan  • 0.5 to 29.9999 MHz wide band general coverage receiver  • USB, LSB, AM, CW, FSK and AFSK modes (Available modes may differ depending on version.)  • RF gain control  • NMEA 0183 interface  • Two DIN connectors for external equipment connection  • Audio activated squelch  • Terminals for frequency/mode control through NMEA interface  • Large front speaker  • Weather fax ready  • Backlight control  • CW full break-in and semi break-in

\* IC-M710 is not available in the USA.

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## Simplified Radio Telephone with 150 W Full Duty Operation

**SSB RADIO TELEPHONE**

# IC-M700PRO

| 150w | 150 | |
|---|---|---|
| 150W(PEP) OUTPUT POWER | CHANNEL | VFO MODE |

### FEATURES

- **Quick channel selection with two large knobs**
- **150 W* full duty operation**
- **Rugged construction for withstanding harsh use**
- **Large, easy-to-read green LCD**
  * 60 W (PEP) above 24 MHz bands.

• Channel scan and channel resume scan  • 0.5 to 29.9999 MHz wide band general coverage receive  • USB, LSB, AM, CW, FSK and AFSK modes (Available modes may differ depending on version.)  • NMEA 0183 interface  • Two DIN connectors for external equipment connection  • Audio activated squelch  • Terminals for frequency/mode control through NMEA interface  • Large front speaker  • Weather fax ready  • Backlight control  • CW full break-in and semi break-in

\* IC-M700PRO is not available in the USA.

# GMDSS
**Global Maritime Distress and Safety System**

The Global Maritime Distress and Safety System (GMDSS) is the International radio safety system for ships mandated by the International Maritime Organization (IMO). The GMDSS system provides automated distress alerting and distress communication service with location information.

## Class A DSC VHF Radio with Wide Viewing Angle Color TFT LCD

**VHF MARINE TRANSCEIVER**
# GM600

GMDSS | BUILT-IN CLASS A DSC | IPX7 SUBMERSIBLE (Front panel only) | 25w OUTPUT POWER | 10w 10W LOUD AUDIO | 4.3-INCH COLOR TFT DISPLAY | COMPACT BODY

MED

Day mode

Night mode



PS-310 DC-DC converter

## Reliable Long Distance MF/HF Communication

**MF/HF MARINE TRANSCEIVER**
# GM800

GMDSS | BUILT-IN CLASS A DSC | IPX7 SUBMERSIBLE (Controller only) | 125w 125W(PEP) OUTPUT POWER | 4.3-INCH COLOR TFT DISPLAY

MED
(Type approval pending as of December 2016.)

**ICOM**
AUTOMATIC ANTENNA TUNER
AT-141

7
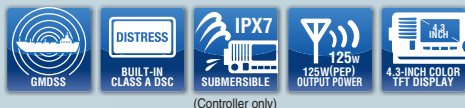
## FEATURES

- **Meets VHF GMDSS requirements for SOLAS ships**
- **MED Directive (2014/90/EU) for European merchant ships**
- **ITU Class A DSC (Meets ITU-R M.493-13)**
- **Large and high contrast 4.3-inch color TFT LCD**
- **Intuitive user interface for straightforward operation**
- **10 W audio output power with external speaker**
- **Dedicated DSC watch receiver for continuous Channel 70 monitoring**

• Printer connector (D-SUB 25-pin) • VDR (Voyage Data Recorder)/External speaker connector

• IEC 61162-1 input/output • Superior sound quality with a wide frequency range and a flat frequency response

• Optional handset, HS-98 • IPX7 submersible for front panel

• Dual watch and Tri-watch functions • Instant access to Ch 16 and call channel

• Tag scan and favorite channel functions • Priority scan function

• Unified design with GM800 (MF/HF) • Supports new 4-digit channels effective from January 1, 2017

**\* GM600 is not available in the USA.**

Day mode

Night mode
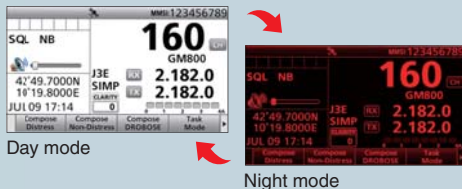
## FEATURES

- **Meets MF/HF GMDSS requirements for SOLAS ships**
- **MED\*¹ Directive (2014/90/EU) for European merchant ship**
- **ITU Class A DSC (Meets ITU-R M.493-13)**
- **Large and high contrast 4.3-inch color TFT LCD**
- **Intuitive user interface for straightforward operation**
- **Dedicated DSC watch receiver for continuous scanning of the six distress channels**
- **Optional automatic antenna tuner, AT-141**

• 125 W*² (PEP) output power • Built-in 24 V DC-DC converter

• Parallel printer port • External SP connector

• IEC 61162-1 input/output • Superior sound quality with a wide frequency range and a flat frequency response
• Supplied handset, HS-98 • IPX7 waterproof for controller

• Maximum 160 programmable channels • Program scan, channel scan and channel resume scan

• Unified design with GM600 (VHF)

*¹ Type approval pending as of December 2015. *² 85 W (PEP) 1.6–3.999 MHz

**Please Note:** The complete GMDSS installation for MF/HF DSC (Class A) and telephony additionally requires the optional antenna tuner, AT-141.

**\* GM800 is not available in the USA.**

### Included Accessories
• Battery pack, BP-252
• Battery charger, BC-173
• AC adapter, BC-147SA/SE*
• Belt clip, MB-103Y
• Antenna, FA-S61V (Fixed type)
• Neck strap
* Depending on version

## SURVIVAL CRAFT 2-WAY RADIO
# IC–GM1600

## GMDSS Portable for Survival Craft

SURVIVAL CRAFT

## FEATURES

- **Meets strict environmental requirements for GMDSS**
- **2W output power for long lasting battery**
- **Primary (non-rechargeable) lithium battery pack, BP-234**
- **Highly visible yellow-colored body**

• Instant access to Ch 16 and call channel • Auto power save • 4-step battery indicator

# Marine Radars

## 12.1-inch Color TFT Marine Radar

**COLOR TFT MARINE RADARS**

# MR-1210RⅡ
# MR-1210TⅡ
# MR-1210TⅢ

6.5 ft Open Scanner for MR-1210TⅢ

4 ft Open Scanner for MR-1210TⅡ/TⅢ

2 ft Radome Scanner for MR-1210RⅡ

### Feature icons
36NM 4kW RADOME | 48NM 4kW OPEN ARRAY | 72NM 6kW OPEN ARRAY | 12.1-INCH COLOR TFT DISPLAY | SIMPLIFIED ATA | AIS OVERLAY | NEW INTERFACE | MULTI-LANGUAGE

## FEATURES

- **12.1-inch color TFT display (600 × 800 dots)**
- **Three types of scanner units**
  - **MR-1210RⅡ: 36 NM range, 4 kW radome scanner**
  - **MR-1210TⅡ: 48 NM range, 4 kW open array scanner**
  - **MR-1210TⅢ: 72 NM range, 6 kW open array scanner** (6.5 ft type and 4 ft type)
- **Intuitive user interface**
- **Multi-Language Interface (English, Spanish, Vietnamese, Indonesian, Korean)**

- **AIS overlay and favorite AIS functions*[1]**
- **Simplified ATA (Automatic Tracking Aid) function**
- **Stabilized head up mode*[1]**
- **True trail function*[1]**
- **Optional Video Output Unit, UX-234 for connection with an external display**

*[1] External data such as AIS, heading sensor and/or NMEA 0183 required separately.

**\* MR-1210 marine radar is not available in the USA.**

Credits: This product includes "zlib", "libevent", "libusb" and "freetype" open source software, and is licensed according to the open source software license.

## 12.1-inch TFT Display Provides Clear Radar Images

**TFT MARINE RADAR**

# MR-1200RⅡ

2ft Radome Scanner

### Feature icons
36NM 4kW RADOME | 12.1-INCH TFT DISPLAY | SIMPLIFIED ATA | AIS OVERLAY | MULTI-LANGUAGE

## FEATURES

- **12.1-inch TFT display (600 × 800 dots)**
- **36 NM range, 4 kW radome scanner**
- **Intuitive user interface**
- **Multi-Language Interface (English, Indonesian and Korean)**

- **AIS overlay and favorite AIS functions*[1]**
- **Simplified ATA (Automatic Tracking Aid) function**
- **Improved STC and Sidelobe for Small Target Detection**
- **MOB (Man overboard) marker keeps the position on the display**

*[1] External data such as AIS, heading sensor and/or NMEA 0183 required separately.

**\* MR-1200 marine radar is not available in the USA.**

# IP ADVANCED RADIO SYSTEM

# Full-Duplex Communication That Works Over a Wireless LAN and IP Network

## System Features

### Wireless Communication System among Ship Crews*

By installing wireless access points, the IP advanced radio system can easily deploy along the IP network and communicate throughout in the vessel. The IP100H can access the nearest access point and can roam between access points.
* Please confirm legal requirements in your country before installation.

### Individual, Group or Area Communication

The IP100H/IP100FS can make individual call, group conference call, all call and area call. Crews spread across multiple rooms and cabins can communicate seamlessly. The IP communication terminal can receive Short Data Messages with a vibration alert from a PC-installed IP100FS.

### Hands-free, Full-duplex Communication

With optional earphone-mic or headset HS-102 or HS-85*, the IP100H user can simultaneously talk and receive like a phone call. Hands-free operation allows your staff to carry out other tasks at the same time.
* Either HM-153LS, HM-166LS, HS-102 with OPC-2359 or HS-85 with OPC-2144 is required.

### Interconnect between VHF Marine Transceiver and Public Address System

With the VE-PG3 RoIP gateway, the IP advanced radio system can interconnect with a VHF marine transceiver, other radio system and a public address system.
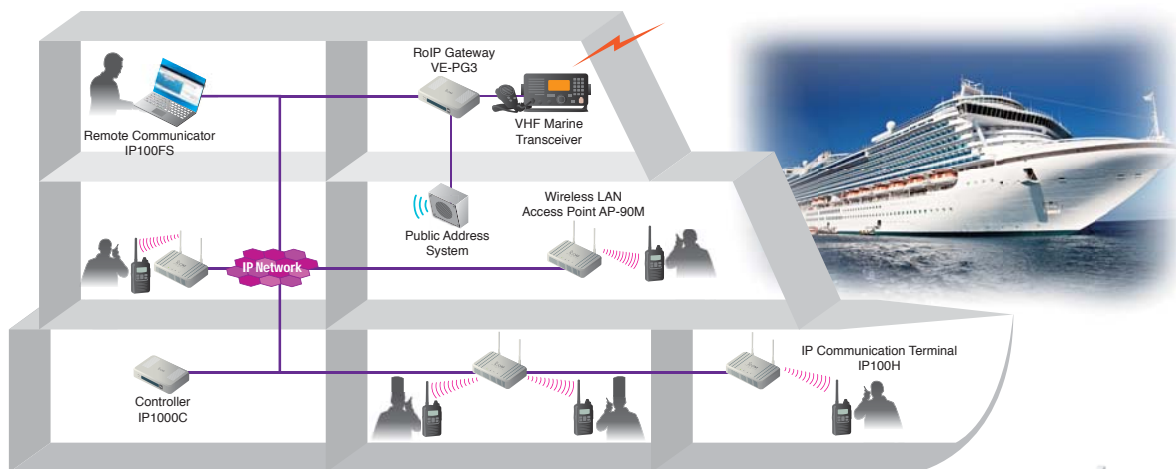


## IP Communication Terminal
# IP100H

- License-free communication terminal using IEEE 802.11 a/b/g/n standards
- WPA-PSK or WPA2-PSK encryption
- IPX7 submersible (1m depth water for 30 minutes)
- Compact 58 × 95 × 26.4 mm (2.3 × 3.7 × 1.0 in) body and 205 g (7.2 oz, approximate) light weight
- Vibration alert function for incoming calls

## Remote Communicator Software
# IP100FS
(Supplied with USB flash drive for use as a USB hardware key)

- The IP100FS can communicate with IP communication terminals from a PC
- The IP100FS can obtain location information of each IP100H based on using access points
- Can be installed on a Windows® based tablet PC as well as laptop PC

## Wireless LAN Access Point
# AP–90M

- IEEE 802.11 a/b/g/n/ac compliant
- PoE (Power over Ethernet) capability
- Optional RS-AP3, access point management software

## Controllor
# IP1000C

- The IP1000C controls all terminal configurations and voice traffic
- Capable of controlling up to 100 or 20* terminals (including IP100FS)
  *Depending on version.

## RoIP Gateway
# VE–PG3

- Interconnects IP advanced radio system and other radio system*
- Public address system connection
- Telephone interconnection with IP phone and PSTN lines
  *Interconnection with VHF marine radio may be prohibited in some countries. Please confirm legal requirements in your country before installation.

# MarineCommander™

## System Overview

The MarineCommander™ is Icom's marine navigation system, which integrates various marine modules such as a fish finder, marine radar, AIS and VHF transceiver into the multi-function display (MFD).

**MXD - 5000**

## Affordable Dual Display Connection
## Up to Four Displays in a System

The MarineCommander allows you to connect two MFDs simultaneously. All connected modules including chart data, fish finder and marine radar can be shared with two MFDs and provide separate operation. When connecting two MarineCommanders via a data cable, up to 4 displays can be used and C-MAP™ chart data can be shared in the system.

MULTI-FUNCTION DISPLAY (MFD)
**MXD–5000**

MAIN PROCESSOR UNIT (MPU)
**MXP–5000**

## Daylight Viewable Display

The 12.1-inch size MFD provides 800 × 600 pixels resolution. The 900 cd/m² color LCD with anti-reflecting surface coating glass offers bright, vivid indication in detail – even under direct sunlight.

## C-MAP™ MAX Compatible

The MarineCommander is compatible with the C-MAP™ MAX chart by C-MAP Italy S.r.l. in an SD card format*. The Marine-Commander provides quick and fast responding rendering performance. The C-MAP™ MAX chart provides guardian alarm, route-check, perspective view and port database for your safe and easy navigation.

\* Chart data is not supplied from Icom.

Perspective view (bird view)
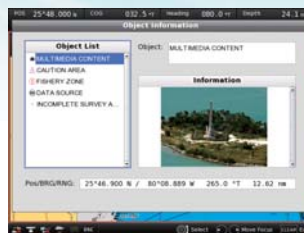
Chart plotter

Object information of the C-MAP™ chart data base

Nav-course monitor (upper right) & Nav-waypoint (bottom right)

# Marine Radar

The MXR-5000R/T marine radar provides clear target separation. Waypoint and AIS target can be overlaid on the radar screen. The marine radar helps collision avoidance and increases your safety at sea. The radar images can be overlaid on the plotter screen in the same scale and help you to detect dangerous objects.


Radar screen

**MARINE RADAR**
## MXR-5000T

4 kW, 4 feet (120 cm) open array scanner
• Up to 48 NM observation   • 48 rpm high-rotation speed


Radar main unit

**MARINE RADAR**
## MXR-5000R

4 kW, 2 feet (60 cm) radome scanner
• Up to 36 NM observation   • 48 rpm high-rotation speed


Radar main unit

# VHF Radio and AIS data

The MairneCommander has the capability to be connected to compatible Icom VHF transceivers. Various types of DSC calls, including individual, group, all ship, position and polling request*, can be initiated from the MarineCommander. VHF radio received DSC messages and position information can be shown on the plotter display. The IC-M605 or MA-500TR AIS data can be overlaid on the plotter and radar screen.

* Type of transmitting DSC calls are depending on the connected VHF transceiver's capability.

This product includes software (part of tcp_wrappers) developed by the University of California, Berkeley and its contributors.

# Fish Finder

When a fish finder module is connected, the MarineCommander system can have a dual frequency sounder function. Using the 50 kHz/200 kHz dual frequency mode, the MarineCommander enhances the separation and helps in fish detection.


Sounder screen

**FISH FINDER**
## MXF-5000



+

### EX-3193
600 W transom transducer
• Depth, speed and temperature in one housing
• 50 kHz and 200 kHz dual frequency



### EX-3194
600 W thru-hull transducer
• Depth, speed and temperature in one housing
• 50 kHz and 200 kHz dual frequency



### EX-3195
1 kW thru-hull transducer
• Depth and fast-response
  water temperature sensor
• 50 kHz and 200 kHz dual frequency



# Other Features

• An analog RGB output connector (D-SUB 15-pin) for an external display connection
• Four analog video input (NTSC or PAL format)
• Multiple language display (English/French/Spanish)
• External NMEA 2000 connectivity (Engine, fuel, engine temperature, wind, GPS, compass, STW) and virtual engine monitor screen
• MXG-5000S GPS receiver
• Memo function allows you to store a comment with picture data* and position information.

* To show picture data, the picture data must be stored in the connected USB flash drive.

# Options for VHF Handheld Transceivers

| MODEL NAME | BATTERY CASES | | BATTERY PACKS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | BP-251*1 LR03 (AAA) × 5 cells | BP-226 LR6 (AA) × 5 cells | BP-227UL (Li-ion) 7.4 V/1850 mAh (min.) 1950 mAh (typ.) | BP-285 (Li-ion) 7.2 V/1485 mAh (min.) 1570 mAh (typ.) | BP-245H (Li-ion) 7.2 V/2100 mAh (min.) 2250 mAh (typ.) | BP-252 (Li-ion) 7.4 V/940 mAh (min.) 980 mAh (typ.) | BP-227 (Li-ion) 7.4 V/1850 mAh (min.) 1950 mAh (typ.) | BP-274 (Li-ion) 7.4 V/1800 mAh (min.) 1900 mAh (typ.) | BP-234 (Lithium) 9.0 V/3300 mAh (non-rechargeable) |
| IC-M93D | | | | ✔ | | | | | |
| IC-M73 | | | | | ✔ | | | | |
| IC-M25*2 | | | | | | | | | |
| IC-M36 | ✔ | | | | | ✔ | | | |
| IC-M88 | | ✔ | | | | | ✔ | ✔ | |
| IC-M88 UL | | | ✔ | | | | | | |
| IC-GM1600 | | | | | | ✔ (On-board use only) | | | ✔ (For survival craft) |

*1 The IC-M36 floats when used with most common brand AAA batteries. Battery weight varies by manufacturer. Please check your IC-M36 for buoyancy in a shallow area first when using AAA batteries.
*2 As the Lithium-ion battery cell (3.7 V 1500 mAh) is built-in to the IC-M25, the user cannot replace the battery cell.

| MODEL NAME | DESKTOP CHARGERS | | | | | | USB CHARGER | |
|---|---|---|---|---|---|---|---|---|
| | BP-220 Rapid charger | BC-210 Rapid charger | BC-162 Rapid charger | BC-173 Regular charger | BC-190 Rapid charger | BC-152N Regular charger | BC-217S*4 5 V/1 A | |
| IC-M93D | ✔ | | | | | | | |
| IC-M73 | | ✔ | | | | | | |
| IC-M25 | | | | | | | ✔ | |
| IC-M36 | | | ✔ | ✔ | | | | |
| IC-M88 | | | | | ✔ | ✔ | | |
| IC-M88 UL | | | | | ✔*3 | ✔*3 | | |
| IC-GM1600 | | | | ✔ (On-board use only) | | | | |

| MODEL NAME | MULTI-CHARGERS | | AC ADAPTERS | | | | CHARGER ADAPTERS | |
|---|---|---|---|---|---|---|---|---|
| | BC-214 Rapid charger | BC-197 Rapid charger | BC-123S*4 12 V/1 A | BC-145S*4 16 V/0.93 A | BC-147S*4 12 V/200 mA | BC-157S 12 V/7.5 A | AD-128*5 AD-129*5 AD-133*6 | |
| IC-M93D | ✔ (Use with AD-133) | | ✔ (Use with BC-220) | | | ✔ (Use with BC-214) | ✔ (Use AD-133 with BC-214) | |
| IC-M73 | | ✔ (Use with AD-129) | ✔ (Use with BC-210) | | | ✔ (Use with BC-197) | ✔ (Use AD-129 with BC-197) | |
| IC-M25 | | | | | | | | |
| IC-M36 | | | ✔ (Use with BC-162) | ✔ (Use with BC-162) | ✔ (Use with BC-173) | | | |
| IC-M88 | | ✔ (Use with AD-128) | ✔ (Use with BC-190) | | ✔ (Use with BC-152N) | ✔ (Use with BC-197) | ✔ (Use AD-128 with BC-197) | |
| IC-M88 UL | | ✔*3 (Use with AD-128) | ✔ (Use with BC-190) | | ✔ (Use with BC-152N) | ✔ (Use with BC-197) | ✔ (Use AD-128 with BC-197) | |
| IC-GM1600 | | | | | ✔ (Use with BC-173, On-board use only) | | | |

*3 The battery charger must not be used in an explosive atmosphere.
*4 BC-123/BC-145/BC-147/BC-217SA for USA plug, SE for Europe plug, SV for Australia plug.
*5 Either AD-128 or AD-129 is supplied with BC-197, depending on version.
*6 AD-133 is supplied with BC-214, depending on version.

✔ : Applicable          : Not applicable

Some options may not be available in some countries. Please ask your dealer for details.

# Options for VHF Handheld Transceivers

| MODEL NAME | CIGARETTE LIGHTER CABLES | | DC POWER CABLES | | SPEAKER MICROPHONES | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | CP-25H | CP-23L | OPC-515L | OPC-656 | HM-168IS (Submersible) | HM-228 (Submersible) | HM-165 (Submersible) | HM-202 (Submersible) | HM-167 (Submersible) |
| IC-M93D | ✔ (Use with BC-220) | | | ✔ (Use with BC-214) | | ✔ | ✔ | | |
| IC-M73 | ✔ (Use with BC-210) | | ✔ (Use with BC-210) | ✔ (Use with BC-197) | | | | ✔ | ✔ |
| IC-M25 | | | | | | | | | |
| IC-M36 | | | | | | | ✔ | | |
| IC-M88 | | ✔ (Use with BC-152N) | ✔ (Use with BC-152N) | ✔ (Use with BC-197) | | | | | |
| IC-M88 UL | | ✔ (Use with BC-152N) | ✔ (Use with BC-152N) | ✔ (Use with BC-197) | ✔ | | | | |
| IC-GM1600 | | | | | | | | | |

| MODEL NAME | SPEAKER MICROPHONES | | | BELT CLIPS | | LEATHER BELT HANGERS | | | ANTENNAS |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | HM-213 (Submersible) | HM-168 (Submersible) | HM-138 (Submersible) | MB-86 Swivel type | MB-98 MB-103/103Y MB-109 MB-133 Alligator | MB-96N Swivel type | MB-96F Fixed type | MB-F96FL Long type | FA-S59V FA-S64V FA-SC58V FA-SC59V |
| IC-M93D | | | | | ✔ (Use MB-133) | | ✔ | ✔ | FA-SC59V |
| IC-M73 | | | | ✔ | ✔ (Use MB-103) | ✔ | ✔ | ✔ | FA-S59V or FA-S64V |
| IC-M25 | ✔ | | | | ✔ (Use MB-133) | | | | FA-SC59V |
| IC-M36 | | | | | ✔ (Use MB-109) | | | | FA-SC58V |
| IC-M88 | | ✔ | ✔ | ✔ | ✔ (Use MB-98) | ✔ | ✔ | ✔ | FA-SC59V |
| IC-M88 UL | | | | | ✔ (Use MB-98) | ✔ | ✔ | ✔ | FA-SC59V |
| IC-GM1600 | | | | ✔ | ✔ (Use MB-103Y) | ✔ | ✔ | ✔ | Fixed type |

*Photo shows MB-109*

*FA-S59V (left) & FA-S64V (right)*

The IC-M88 UL version should only be used with the specified Intrinsically Safe approved options. Some options may not be available in some countries. Please ask your dealer for details.

✔ : Applicable      : Not applicable

# Specifications for VHF Handheld Transceivers

| | IC-M93D | IC-M73 | IC-M25 | IC-M36 | IC-M88 | IC-M88 UL | IC-GM1600 |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Frequency range (Unit: MHz) | Tx: 156.025–157.425 Rx: 156.050–163.275 CH 70: 156.525 | Tx: 156.025–157.425 Rx: 156.050–163.275 | Tx: 156.025–157.425 Rx: 156.050–163.275 | Tx: 156.025–157.425 Rx: 156.050–163.275 | Tx: 156.025–157.425 Rx: 156.050–163.275 LMR: TX/RX 146–174 | | TX/RX: 156.300–156.875 |
| Dimensions (W × H × D; Projections not included) | 57 × 144.6 × 38.5 mm; 2.2 × 5.7 × 1.5 in | 52.5 × 125 × 30 mm; 2.1 × 4.9 × 1.2 in | 56.6 × 134.2 × 30.5 mm; 2.2 × 5.3 × 1.2 in | 62 × 139.5 × 43 mm; 2.4 × 5.5 × 1.7 in | 62 × 97 × 39 mm; 2.4 × 3.8 × 1.5 in | | 65 × 145 × 44 mm; 2.6 × 5.7 × 1.7 in |
| Weight (approx.) | 300 g; 10.6 oz (With BP-285, MB-133 and FA-SC59V) | 320 g; 11.3 oz (With BP-245H, MB-103 and FA-S59V) | 220 g; 7.8 oz (With MB-133 and FA-SC59V) | 295 g; 10.4 oz (With BP-252, MB-109 and FA-SC58V) | 280 g; 9.9 oz (With BP-227) | 280 g; 9.9 oz (With BP-227UL) | 385 g; 13.6 oz (With BP-234) |
| Current drain — Transmit (High) | 1.5 A | 1.5A typical | 2.3 A (at 3.7 V DC) | 1.5 A typical | 1.6 A typical | | 1.0 A/0.7 A (2 W/1 W) |
| Current drain — Max. audio | 250 mA typ. (External SP) 450 mA typ. (Internal SP) | 250 mA typ. (External SP) 450 mA typ. (Internal SP) | 300 mA typ. (External SP) 200 mA typ. (Internal SP) | 300mA typ. (Internal SP) | 200 mA typ. (Internal SP) | | 200 mA |
| Sensitivity (at 12 dB SINAD) | 0.25 µV typical | 0.22 µV typical | 0.25 µV typical | 0.25µV typical | 0.25 µV typical | | 0.25 µV typ. (USA version) |
| Intermodulation rejection | 70 dB typical | 70 dB typical | 70 dB typical | 70dB typical | 70 dB (Marine) 60 dB (LMR) | | 70 dB (USA version), 68 dB (GEN version) |
| Audio output power (10% distortion) | 900 mW typ. (Internal SP) 350 mW typ. (External SP) | 700 mW typ. (Internal SP) 350 mW typ. (External SP) | 550 mW typ. (Internal SP) 300 mW typ. (External SP) | 700 mW typ. (Internal SP) | 350 mW typ. | | 350 mW typ. |
| RF output power | 5/1 W | 6/3/1W | 5/1 W | 6/1 W (With BP-252) 2/1 W (With alkaline cells) | 5/3/1 W | | 2/1 W |
| Operating time (approx.) | 9 hours (with BP-285) | PLUS version 17 hours Basic version 20 hours (with BP-245H) | 11 hours (with built-in battery) | 8 hours (with BP-252) | 15 hours (with BP-227) | 15 hours (with BP-227UL) | Specified as IMO A.809 (19) |
| Waterproof protection | IPX7 (1 m depth/30 min) | IPX8 (1.5 m depth/30 min) | IPX7 (1 m depth/30 min) | IPX7 (1 m depth/30 min) | IPX7 (1 m depth/30 min) | | Specified as IMO A.809 (19) |

Measurements made in accordance with TIA/EIA603 for IC-M93D, M73, M25, M36 and M88. TIA/EIA603 and FCC Part 80.271 for IC-GM1600.

| MODEL NAME | HAND MICROPHONES | | | | COMMAND HEAD | COMMANDMIC™ | | HANDSET | HORN SPEAKER |
|---|---|---|---|---|---|---|---|---|---|
| | HM-205B/RB/SW Speaker microphone | HM-200B/SW | HM-164B | HM-214V | RC-M600 HM-205RB and 10 m; 32.8 ft cable supplied | HM-195B/SW 6.1 m; 20 ft cable supplied | HM-195GB/GW 6.1 m; 20 ft cable supplied | HS-98 | SP-37 |
| IC-M605 | ✔ (HM-205RB) | | | | ✔ | ✔ (Use with OPC-2384) | ✔ (Use with OPC-2384) | | ✔ |
| IC-M506 | ✔ | | | | | ✔ | ✔ | | ✔ |
| IC-M424G | ✔ | | | | | ✔ | ✔ | | ✔ |
| IC-M400BB | | | | | | ✔ | ✔ | | ✔ |
| IC-M324G | | ✔ | | | | | | | ✔ |
| IC-M324 | | ✔ | | | | | | | ✔ |
| IC-M200 | | | ✔ | | | | | | ✔ |
| GM600 | | | | ✔ | | | | ✔ | |

| MODEL NAME | CONVERSION CABLE | EXTENSION CABLES | | | DC-DC CONVERTER | FLUSH MOUNT KITS | | | DUST COVER |
|---|---|---|---|---|---|---|---|---|---|
| | OPC-2384 12-pin to 8-pin Required for IC-M605 and COMMANDMIC connection | OPC-2377 10 m; 32.8 ft cable for use with COMMAND HEAD | OPC-1541 6.1 m; 20 ft cable for use with COMMANDMIC and rear microphone connection | OPC-1000 6.1 m; 20 ft cable for use with rear microphone connection | PS-310 #01 24 V input #02 12 V input | MB-132 | MB-75 | MB-69 | MB-92 |
| IC-M605 | ✔ (Use with HM-195) | ✔ (Use with RC-M600) | ✔ (Use with HM-195, HM-205RB) | ✔ (Use with HM-205RB) | | | ✔ | | |
| IC-M506 | | | ✔ (Use with HM-195, rear mic version) | ✔ (For use with rear mic version) | | ✔ | ✔ | | |
| IC-M424G | | | ✔ (Use with HM-195) | | | ✔ | | | |
| IC-M400BB | | | ✔ (Use with HM-195) | | | | | | |
| IC-M324G | | | | | | ✔ | | | |
| IC-M324 | | | | | | ✔ | | | |
| IC-M200 | | | | | | | | ✔ | ✔ |
| GM600 | | | | | ✔ | | | | |

| MODEL NAME | VOICE SCRAMBLER | AIS RECEIVER UNIT | | NMEA2000 INTERFACE | GNSS ANTENNA |
|---|---|---|---|---|---|
| | UT-112 Total of 32 voice scramble codes available | UX-251 | UX-231 | UX-232 | UX-241 |
| IC-M605 | ✔ | ✔* (Installed, depending on version) | | | ✔ (Same as supplied) |
| IC-M506 | ✔ | | ✔* (Installed, depending on version) | ✔* (Installed, depending on version) | |
| IC-M424G | | | | | |
| IC-M400BB | | | | | |
| IC-M324G | | | | | |
| IC-M324 | | | | | |
| IC-M200 | | | | | |
| GM600 | | | | | |

* See configuration chart (right).

### IC-M605 & M506 Configuration Variations

| | Microphone | NMEA 2000 | AIS Receiver |
|---|---|---|---|
| IC-M605 AIS | Front and rear configurable | NMEA 2000/ NMEA 0183 | Integrated AIS Receiver |
| IC-M605 | Front and rear configurable | NMEA 2000/ NMEA 0183 | Not included[2] |
| IC-M506 AIS | Front Mic | NMEA 2000/ NMEA 0183 | Integrated AIS Receiver |
| | Rear Mic | | |
| IC-M506 PLUS | Front Mic | NMEA 2000/ NMEA 0183 | Not included[3] |
| | Rear Mic | | |
| IC-M506 | Front Mic | NMEA 0183[1] | Not included[3] |

[1] Optional UX-232 is required for NMEA 2000.
[2] Optional UX-251 is required for AIS receiver.
[3] Optional UX-231 is required for AIS receiver.
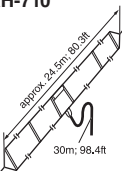
# Options for MF/HF Transceivers

| MODEL NAME | HAND MICROPHONES | | | HANDSET | EXTERNAL SPEAKERS | | FLUSH MOUNT KIT | MOUNTING BRACKET |
|---|---|---|---|---|---|---|---|---|
| | HM-214H | HM-135 | HM-180 | HS-98 | SP-24 | SP-24E | MB-75 | MB-108 |
| GM800 | ✔ | | | ✔ | | ✔ | | ✔ |
| IC-M802 | | ✔ | | | ✔ | | ✔ | |
| IC-M710 | | | ✔ | | | | | |
| IC-M700PRO | | | ✔ | | | | | |

| MODEL NAME | FOLDED DIPOLE ANTENNA | ANTENNA MATCHERS | | ANTENNA TUNERS | | | SHIELDED CONTROL CABLES | |
|---|---|---|---|---|---|---|---|---|
| | AH-710 | MN-100 | MN-100L | AT-130 | AT-140 IP56 | AT-141 IP56 | OPC-1465 10 m; 32.8 ft | OPC-1147/N 10 m; 32.8 ft |
| GM800 | | | | | | ✔ | ✔ (Use with AT-141) | |
| IC-M802 | ✔ | ✔ | ✔ | ✔ | ✔ | | | ✔ (Use with AT-140) |
| IC-M710 | ✔ | ✔ | ✔ | ✔ | ✔ | | | |
| IC-M700PRO | ✔ | ✔ | ✔ | ✔ | ✔ | | | |

| MODEL NAME | SHIELDED CONTROL CABLES | SEPARATION CABLE | REMOTE CONTROLLER | FILTER |
|---|---|---|---|---|
| | OPC-566 10 m; 32.8 ft | OPC-1106 5 m; 16.4 ft | RC-25 | FL-100 Bandwidth: 500 Hz/–6 dB CW/FSK narrow |
| GM800 | | | | |
| IC-M802 | ✔ (Use with AT-130) | ✔ | ✔ | |
| IC-M710 | ✔ (Use with AT-130) | | | ✔ |
| IC-M700PRO | ✔ (Use with AT-130) | | | ✔ |

## AIS TRANSPONDER

| MODEL NAME | FLUSH MOUNT KIT | GPS RECEIVER |
|---|---|---|
| | MB-75 | MXG-5000S |
| MA-500TR | ✔ | ✔ |

# Options for Marine Radars

| MODEL NAME | VIDEO OUTPUT UNIT | SYSTEM CABLES | |
|---|---|---|---|
| | UX-234 | OPC-2339 20 m (65.6 ft) | OPC-2340 30 m (98.4 ft) |
| MR-1210RII | ✔ | ✔ | ✔ |
| MR-1210TII/TIII | ✔ | | ✔ |
| MR-1200RII | | ✔ | ✔ |

✔ : Applicable    : Not applicable

Some options may not be available in some countries. Please ask your dealer for details.

## VHF FIXED MOUNT TRANSCEIVERS

| | IC-M605 | IC-M506 | IC-M424G | IC-M400BB | IC-M324G | IC-M324 | IC-M200 | GM600 |
|---|---|---|---|---|---|---|---|---|
| Frequency range (Unit: MHz) | Tx: 156.025–161.600 Rx: 156.050–163.275 CH70: 156.525 AIS1,2: 161.975, 162.025 | Tx: 156.025–157.425 Rx: 156.050–163.275 CH70: 156.525 AIS1,2: 161.975, 162.025 | Tx: 156.025–157.425 Rx: 156.050–163.275 CH70: 156.525 | Tx: 156.025–157.425 Rx: 156.050–163.275 CH70: 156.525 | Tx: 156.025–157.425 Rx: 156.050–163.275 CH70: 156.525 | | Tx: 156.025–157.425 Rx: 156.050–163.275 | Tx: 156.025–161.600 Rx: 156.025–162.000 CH70: 156.525 |
| Power supply requirement | 13.8 V DC ±15% | 13.8 V DC ±15% | 13.8 V DC ±15% | 13.8 V DC ±15% | 13.8 V DC ±15% | | 13.8 V DC ±15% | 24 V DC (21.6–31.2 V DC)[*2] |
| Dimensions (W × H × D; Projections not included) | 274 × 114 × 121.5 mm; 10.8 × 4.5 × 4.8 in | 178.9 × 113.9 × 113.8 mm; 7.0 × 4.5 × 4.5 in | 180 × 82 × 119.9 mm; 7.1 × 3.2 × 4.7 in | 216 × 79 × 125 mm; 8.5 × 3.1 × 4.9 in | 180 × 82 × 119.9 mm; 7.1 × 3.2 × 4.7 in | | 153 × 67 × 133 mm; 6.0 × 2.6 × 5.2 in | 274 × 114 × 121.5 mm; 10.8 × 4.5 × 4.8 in |
| Weight (approx.) | 1.51 kg; 3.3 lb | 1.4 kg; 3.1 lb | 1.2 kg 2.6 lb | Main unit 830 g; 1.8 lb HM-195 400 g; 14.1 oz | 1.2 kg; 2.6 lb | | 800 g; 1.76 lb | 1.6 kg; 3.5 lb |
| Current drain — Transmit (High) | 6 A | 5.5 A | 5.5 A | 5.5 A | 5.5 A | | 5.5 A | 3.3 A[*2] |
| Current drain — Max. audio | 5 A typ. (Ext SP, RX hailer ON) 8 A Max. (Ext SP, RX hailer ON, HM-195 × 3) | 5 A typ. (Ext SP, RX hailer ON) 1.5 A (Internal SP) | 5 A typ. (Ext SP, RX SP ON) 1.5 A (Internal SP) | 3.5 A | 1.5 A | | 1.5 A | 2.0 A[*2] |
| Sensitivity (at 12 dB SINAD) | 0.22 µV typical | 0.22 µV typical | 0.22 µV typical | 0.22 µV typical | 0.22 µV typical | | 0.22 µV typical | –7 dBµ emf (20 dB SINAD) |
| Intermodulation rejection | More than 80 dB | More than 75 dB | More than 70 dB | More than 70 dB | More than 70 dB | | More than 70 dB | More than 75 dB (Main) |
| Audio output power (10% distortion/4Ω load) | 15 W (External SP) | 15 W (External SP) | 10 W typ. (External SP) | 10 W (External SP) 2 W (HM-195 series) | 4.5 W typical (External SP) | | 4.5 W typical (External SP) | 10 W (External SP) |
| RF output power | 25/1 W | 25/1 W | 25/1 W | 25/1 W | 25/1 W | | 25/1 W | 25/1 W |
| NMEA interface | NMEA 2000, NMEA 0183/0183-HS × 2 | NMEA 2000*/0183 | NMEA 0183 | NMEA 0183 | NMEA 0183 | | NMEA 0183 | IEC 61162-1 |
| AIS receiver | Built-in[*1] | Built-in[*1] | – | – | – | | – | – |
| Built-in GPS receiver | Yes | – | Yes | – | Yes | | – | – |

Measurements made in accorance with TIA/EIA 603 for IC-M605, M506, M424G, M400BB, M324G, M324, M200 and EN301 925 for GM600.  [*1] Depending on version.  [*2] With PS-310 (#01)

## MF/HF TRANSCEIVERS

| | | IC-M802 | IC-M710 | IC-M700PRO | GM800 |
|---|---|---|---|---|---|
| Frequency range (Unit: MHz) | | Tx: 1.6–27.5000 (ITU channels) Rx: 0.5–29.9999 | Tx: 1.6–27.5000 (ITU channels) Rx: 0.5–29.9999 | Tx: 1.6–27.5000 (ITU channels) Rx: 0.5–29.9999 | Tx: 1.6–27.5000 (ITU channels) Rx: 0.5–29.9999 (continuously) DSC: 2.1875, 4.2075, 6.3120, 8.4145, 12.5770, 16.8045 |
| Type of emission | Tx/Rx | J3E (USB/LSB), H3E[*2] (AM), J2B (AFSK), F1B (FSK), R3E, A1A (CW) | J3E (USB/LSB), H3E (AM), J2B (AFSK), F1B (FSK), R3E, A1A (CW)[*4] | J3E (USB,/LSB), H3E (AM), J2B (AFSK), F1B (FSK), R3E, A1A (CW)[*4] | J3E (USB/LSB[*1]) (AM), H3E[*1] (AM), J2B (AFSK), F1B (FSK), A1A[*1] (CW) |
| | DSC | J2B[*3] | | | F1B |
| Power supply requirement | | 13.6 V DC ±15% | 13.6 V DC ±15% | 13.6 V DC ±15% | 21.6–31.2 V DC (floating ground) |
| Dimensions (W×H×D; projections not included) | Main unit | 240 × 94 × 238.4 mm; 9.4 × 3.7 × 9.4 in | 291.4 × 116.4 × 315 mm; 11.5 × 4.6 × 12.4 in | 291.4 × 116.4 × 315 mm; 11.5 × 4.6 × 12.4 in | 367 × 95 × 269 mm; 14.4 × 3.7 × 10.6 in |
| | Controller | 220 × 110 × 84.4 mm; 8.7 × 4.3 × 3.3 in | | | 274 × 114 × 86mm; 10.8 × 4.5 × 3.4 in |
| Weight (approx.) | Main unit | 4.7 kg; 10.4 lb | 7.8 kg; 17.2 lb | 7.8 kg; 17.2 lb | 8.6 kg; 19.0 lb |
| | Controller | 570 g; 1.3 lb | | | 760 g; 1.7 lb |
| Current drain | Transmit (Max. power) | 30 A typ. | 30 A | 30 A | Less than 20 A (at 1.1 and 1.7kHz two tones) |
| | Receive (Max. audio) | 3.0 A | 2.5 A | 2.5 A | Less than 3.0 A |
| Sensitivity | J3E, A1A | 0.5 µV (1.8–29.999 MHz)[*7] | 0.5 µV (1.8–29.999 MHz)[*8] | 0.35 µV typ. (1.8–29.999 MHz)[*8] | 16 dBµV emf (1.6–3.999 MHz)[*5] 11 dBµV emf (4.0–29.999 MHz)[*5] |
| | J2B, F1B | 0.5 µV (1.8–29.999 MHz)[*7] | – | – | 3 dBµV emf (1.6–2.099 MHz)[*6] 0 dBµV emf (2.1–27.5 MHz)[*6] |
| | J2B, R3E | – | 0.5 µV (1.8–29.999 MHz)[*8] | 0.35 µV typ. (1.8–29.999 MHz)[*8] | – |
| | H3E | 3.2 µV (1.8–3.999 MHz) [*7] | 3.2 µV (1.8–29.999 MHz)[*7] | 2.2 µV typ. (1.8–29.999 MHz)[*7] | 30 dBµV emf (1.6–3.999 MHz)[*5] |
| | DSC (J2B) | 0 dBµV emf [*3] [*6] | | | 0 dBµV emf[*6] |
| RF output power | | 150/60/20 W (1.6–27.5 MHz) | 150/60/20 W (1.6–23.999 MHz) 60/20 W (24.0–27.500 MHz) | 150/60/20 W (1.6–23.999 MHz) 60/20 W (24.0–27.500 MHz) | 125 W (4.0–27.5 MHz) (at AT-141 output) 85 W (1.6–3.999 MHz) (at AT-141 output) |

[*1] Receive only.  [*2] Receive only, depending on version.  [*3] Depending on version.  [*4] Available modes may differ depending on version.  [*5] 20 dB SINAD  [*6] 1% error rate  [*7] 10 dB S/N  [*8] 12 dB SINAD

## MARINE RADARS

| DISPLAY UNIT | MR-1210RII | MR-1210TII | MR-1210TIII | | MR-1200RII |
|---|---|---|---|---|---|
| Display | 12.1-inch color TFT LCD | | | | 12.1-inch TFT LCD |
| Resolution (H × V) | 600 × 800 dots | | | | 600 × 800 dots |
| Minimum range | 25 m (at 1/8 NM range) | | | | 25 m (at 1/8 NM range) |
| Maximum range | 36 NM | 48 NM | 72 NM | | 36 NM |
| Power supply requirement | 10.2–42 V DC | | | | 10.2–42 V DC |
| Dimensions (W × H × D; projections not included) | 300 × 323 × 119.2 mm; 11.8 × 12.7 × 4.7 in | | | | 300 × 323 × 119.2 mm; 11.8 × 12.7 × 4.7 in |
| Weight (approx.) | 4.6 kg; 10.1 lb | | | | 4.5 kg; 9.9 lb |
| Power consumption (approx.) | 60 W | 70 W | 80 W (4 ft open) | 90 W (6.5 ft open) | 60 W |

| SCANNER UNIT | MR-1210RII | MR-1210TII | MR-1210TIII | MR-1200RII |
|---|---|---|---|---|
| Type | 2ft (60cm) radome | 4 ft (120 cm) open array | 6.5 ft (200 cm) open array | 2 ft (60 cm) radome |
| Peak output power | 4 kW | 4 kW | 6 kW | 6 kW | 4 kW |
| Rotation speed | 24, 36 rpm typical | 24, 36 rpm typ. | 22, 24, 36 rpm typ. | 22, 24, 36 rpm typical | 24, 36 rpm typical |
| Beamwidth — Horizontal | 4° typ. | 2° typ. | 1.2° typ. | 4° typ. |
| Beamwidth — Vertical | 22° typ. | 23° typ. | 23° typ. | 22° typ. |
| Transmission frequency | 9410 MHz ±30 MHz | 9410 MHz ±30 MHz | 9410 MHz ±30 MHz | 9410 MHz ±30 MHz |
| Dimensions (W × H × D; projections not included) | 640 × 256 × 640 mm; 25.2 × 10.1 × 25.2 in | 1217 (dia.) × 395 (H) mm; 47.9 (dia.) ×15.6 (H) in | 1995 (dia.)×395 (H) mm; 78.5 (dia.)×15.6 (H) in | 640 × 256 × 640 mm; 25.2 × 10.1 × 25.2 in |
| Weight (approx.) | 8 kg; 17.6 lb | 18 kg; 39.7 lb | 20 kg; 44.1 lb | 8 kg; 17.6 lb |
| Usable temperature range | –25 °C to +70 °C; –13 °F to +158 °F | –25 °C to +70 °C; –13 °F to +158 °F | –25 °C to +70 °C; –13 °F to +158 °F | –25 °C to +70 °C; –13 °F to +158 °F |
| Connection cable | 15 m; 49.2 ft (OPC-2341) | 20 m; 65.6 ft (OPC-2342) | 20 m; 65.6 ft (OPC-2342) | 15 m; 49.2 ft (OPC-2341) |

## AIS TRANSPONDER
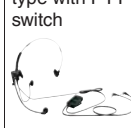
| | MA-500TR |
|---|---|
| Frequency range | 156.025–162.025 MHz |
| Type of emission | 16K0GXW (GMSK) |
| Power supply requirement | 12.0 V DC (9.6–15.6 V) |
| Dimensions (W × H × D; Projections not included) | 165 × 110 × 123 mm; 6.5 × 4.3 × 4.8 in |
| Weight (approx.) | 1.0 kg; 2.2 lb |
| Current drain — Transmit | 1.5 A |
| Current drain — Receive | 0.7 A |
| Sensitivity (20% error rate) | –110 dBm |
| Intermodulation rejection | 65 dB |
| RF output power | 2 W |

Measurements made in accordance with IEC62287-1.

# Options for IP Advanced Radio System

| MODEL NAME | BATTERY PACKS | | BATTERY CASE | RAPID CHARGER | MULTI-CHARGER | SPEAKER-MICROPHONES | | EARPHONE-MICROPHONES | |
|---|---|---|---|---|---|---|---|---|---|
| | **BP-271** (Li-ion) 7.4 V/1150 mAh (min.) 1200 mAh (typ.) | **BP-272** (Li-ion) 7.4 V/1880 mAh (min.) 2000 mAh (typ.) | **BP-273** LR6 (AA) × 3 cells | **BC-202** + BC-123SA/SE | **BC-211** + BC-157S | **HM-183LS** Submersible | **HM-186LS** | **HM-153LS** | **HM-166LS** |
| **IP100H** | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

| MODEL NAME | HEADSETS (Full-duplex operation) | | HEADSETS (Simplex operation) | | | PLUG ADAPTER CABLES | | PTT SWITCH CABLES | |
|---|---|---|---|---|---|---|---|---|---|
| | **HS-102** Earphone type | **HS-85** Over-the-head type with PTT switch | **HS-94** Earhook type with boom microphone | **HS-95** Behind-the-head type | **HS-97** Throat microphone type | **OPC-2006LS** For VOX operation | **OPC-2144** Slim L-type plug | **OPC-2359** | **OPC-2328** For manual PTT operation |
| **IP100H** | (Use with OPC-2359) | (Use with OPC-2144) | (Use with OPC-2006LS or OPC-2328) | ✔ (Use with OPC-2006LS or OPC-2328) | (Use with OPC-2006LS or OPC-2328) | ✔ | ✔ | ✔ | ✔ |

| MODEL NAME | AC ADAPTER | AUDIO CONNECTION CABLES | REMOTE COMMUNICATOR | DIGITAL VOICE CONVERTER | ACCESS POINT MANAGER | DESKTOP MICROPHONE | HAND MICROPHONE | MICROPHONE ADAPTER |
|---|---|---|---|---|---|---|---|---|
| | **BC-207S** 12 V/3.5 A | **OPC-2273*** For VHF radio **OPC-2276*** For HM-152 or SM-26 * 5 m; 16.4 ft | **RC-FS10** | **CT-24** | **RS-AP3** | **SM-26** | **HM-152** | **CT-23** |
| **IP100FS** | | | | | | ✔ (Use with CT-23) | ✔ (Use with CT-23) | ✔ |
| **AP-90M** | ✔ | | | | ✔ | | | |
| **IP1000C** | | | | | | | | |
| **VE-PG3** | ✔ | ✔ | ✔ | ✔ | | ✔ (Use with OPC-2276) | ✔ (Use with OPC-2276) | |

Some options may not be available in some countries. Please ask your dealer for details.

# Specifications for IP Advanced Radio System

| | **IP100H** |
|---|---|
| **Wireless standards** | IEEE 802.11 a/b/g/n |
| **Frequency coverage*** | 2.4–2.4835 GHz, 5.15–5.35, 5.47–5.85 GHz |
| **Dimensions (W×H×D; projections not included)** | 58 × 95 × 26.4 mm ; 2.3 × 3.7 × 1.0 in (with BP-271) |
| **Weight (approx.)** | 205 g; 7.2 oz (with BP-271 and antenna) |
| **RF output power** | Less than 10 mW/MHz |
| **Voice Codec** | G.711μ-law (64 kbps) |
| **AF output power** — Internal SP | 400 mW (typ., 16Ω at 10% distortion) |
| **AF output power** — External SP | 200 mW (typ., 8Ω at 10% distortion) |
| **Security** | WEP (64/128-bit), WPA-PSK (TKIP/AES), WPA2-PSK (TKIP/AES) |
| **Operating time (1:1:8 duty cycle)** | More than 20 hours (with BP-271) |

* Authorized frequency range and channels may differ depending on country.

| | **IP1000C** |
|---|---|
| **Power supply** | 100–240 V AC (with supplied AC adapter) |
| **Dimensions (W × H × D; projections not included)** | 232 × 38 × 168 mm; 9.1 × 1.5 × 6.6 in |
| **Weight (approx.)** | 750 g; 1.7 lb (Main unit only) |
| **LAN** | RJ-45 connector × 4 1000BASE-T/100BASE-TX/ 10BASE-T (AUTO MDI/MDI-X) |
| **USB** | Standard A receptacles ×2 |
| **Maintenance console** | RS-232C (RJ-11) connector |

| | **AP-90M** |
|---|---|
| **Power supply** | 12V DC ±10% or PoE (IEEE802.3af compatible) |
| **Dimensions (W × H × D; projections not included)** | 120 × 29 × 103 mm ; 4.7 × 1.1 × 4.1 in |
| **Weight (approx.)** | 300 g; 10.6 oz (Main unit only) |
| **Wired LAN** | RJ-45 connector × 1 1000BASE-T/100BASE-TX/ 10BASE-T (Auto MDI/MDI-X) |
| **Wireless LAN** | IEEE 802.11 a/b/g/n/ac |
| **Frequency coverage*** | 2.4–2.4835 GHz, 5.15–5.35, 5.47–5.85 GHz |
| **Data rates (theoretical value)** | 11 Mbps, 54 Mbps, 300 Mbps, 866.7 Mbps |
| **Security** | WEP (64/128/152-bit), WPA, WPA2, WPA-PSK, WPA2-PSK |

* Authorized frequency range and channels may differ depending on country.

# Specifications for MarineCommander™

## MULTI-FUNCTION DISPLAY

| | MXD-5000 |
|---|---|
| Multi-function display | 12.1-inch TFT |
| Screen size | 246 × 184.5 mm |
| Screen resolution | SVGA 800 × 600 dots |
| Power supply | 30 V DC (Supplied from MXP-5000) |
| Dimensions (W × H × D; projections not included) | 386 × 274 × 69.2 mm; 15.2 × 10.8 × 2.7 in (without bracket) 404 × 299 × 102 mm; 15.9 × 11.8 × 4.0 in (with bracket) |
| Weight (approx.) | 3.6 kg; 7.9 lb (without bracket) 4.1 kg; 9.0 lb (with bracket) |
| Usable temperature range | −20 °C to +60 °C; −4 °F to +140 °F |
| Waterproofing | IPX7 |
| Cable length | 5 m; 16.4 ft |
| Optional extension cable | EX-3187 (5 m;16.4 ft) |

## MAIN PROCESSOR UNIT

| | MXP-5000 |
|---|---|
| Power supply | 12/24 V DC (10.8 to 31.2 V DC) |
| Current drain (at 12 V DC) (at maximum brightness) | Less than 4.7A (One MXD-5000) Less than 7.7A (Two MXD-5000s) |
| Dimensions (W × H × D; projections not included) | 360 × 88 × 228.8 mm; 14.2 × 3.5 × 9.0 in |
| Weight (approx.) | 4.25 kg; 9.4 lb |
| Usable temperature range | −20 °C to +60 °C; −4 °F to +140 °F |
| Waterproofing | IPX4 |

## FISH FINDER

| | | MXF-5000 |
|---|---|---|
| Power supply | | 12/24 V DC (10.8 to 31.2 V DC) |
| Output power | | 600 W/1 KW |
| Current drain (at 12 V DC) | 600 W output | Less than 0.6 A (Water depth range: 40 m) |
| | 1 kW output | Less than 1.0 A (Water depth range: 40 m) |
| Transmission frequency | | 50 kHz ±1 kHz 200 kHz ±1 kHz |
| Dimensions (W × H × D; projections not included) | | 250 × 67 × 200 mm; 9.8 × 2.6 × 7.9 in |
| Weight (approx.) | | 2.18 kg; 4.8 lb |
| Usable temperature range | | −20 °C to +60 °C; −4 °F to +140 °F |
| Waterproofing | | IPX4 |
| Optional data cable | | OPC-1895 (20 m; 65.6 ft) |

## RADAR UNITS

| | MXR-5000R Radar unit | MXR-5000T Radar unit |
|---|---|---|
| Power supply | 12/24 V DC (10.8 to 31.2 V DC) | |
| Current drain (at 12 V DC) | Less than 5.0 A | Less than 5.5 A |
| Dimensions (W × H × D; projections not included) | 250 × 67 × 200 mm; 9.8 × 2.6 × 7.9 in | |
| Weight (approx.) | 2.1 kg; 4.6 lb | |
| Optional data cable | OPC-1895 (20m; 65.6ft) | |

| | | Radome scanner | Open array scanner |
|---|---|---|---|
| Type | | 2 ft (60 cm) radome | 4 ft (120 cm) open array |
| Peak output power | | 4 kW | 4 kW |
| Maximum range | | 36 NM | 48 NM |
| Rotation speed | | 24 rpm, 36 rpm, 48 rpm | 24 rpm, 36 rpm, 48 rpm |
| Beam width | Horizontal | 4° typ. | 2° typ. |
| | Vertical | 22° typ. | 25° typ. |
| Side lobe | | −18 dB | −24 dB |
| Transmission frequency | | 9410 MHz ±30 MHz P0N | 9410 MHz ±30 MHz P0N |
| Dimensions | | 607 (Diameter) × 243 (H) mm; 23.9 × 9.6 in | 1205 (Diameter of rotation) × 381 (H) mm; 23.9 × 15 in |
| Weight (approx.) | | 8 kg; 17.6 lb (without cable) | 17 kg; 37.4 lb (without cable) |
| Usable temperature range | | −25 °C to +70 °C; −13 °F to +158 °F | −25 °C to +70 °C; −13 °F to +158 °F |
| Waterproofing | | IPX6 | IPX6 |
| Supplied system cable | | OPC-2341 (15 m; 49.2 ft) | OPC-2342 (20 m; 65.6 ft) |
| Optional radar system cables | | OPC-2339 (20 m; 65.6 ft) OPC-2340 (30 m; 98.4 ft) | OPC-2340 (30 m; 98.4 ft) |

## GPS RECEIVER

| | | MXG-5000S |
|---|---|---|
| Receiving frequency | | 1575.42 MHz |
| Receiving channels | | 66 |
| Receiving code | | L1, C/A-codes, SPS |
| Satellite differential type (SBAS) | | WAAS, EGNOS, MSAS, GAGAN |
| Time to first fix | Cold start | 40 Sec. typ. |
| | Warm start | 4 Sec. typ. |
| Power supply | | 4.75–5.25 V DC (Supplied from MA-500TR or MXP-5000) |
| Dimensions (Diameter×Height) (projections not included) | | 78 × 96.5 mm; 3.1 × 3.8 in |
| Weight (approx.) | | 460 g; 1.0 lb |
| Usable temperature range | | −20 °C to +60 °C; −4 °F to +140 °F |
| Cable length (approx.) | | 10 m; 32.8 ft |

## TRANSDUCERS

| | EX-3193 | EX-3194 | EX-3195 |
|---|---|---|---|
| Type | 600 W transom type, built-in boat speed and temperature sensors | 600 W thru-hull type, built-in boat speed and temperature sensors | 1 kW thru-hull type, built-in temperature sensors |
| Output power | 600 W | 600 W | 1 kW |
| Operating frequency | 50 kHz, 200 kHz | 50 kHz, 200 kHz | 50 kHz, 200 kHz |
| Beamwidth | 50 kHz: 45°, 200 kHz: 11° | 50 kHz: 45°, 200 kHz: 11° | 50 kHz: 15°×21°, 200 kHz: 3°×5° |
| Vessel speed sensor | 18,000 p/nm | 19,000 p/nm (with fairing) 21,500 p/nm (without fairing) | – |
| Speed range | 1 kt–44 kt | 1 kt–44 kt | – |
| Weight (approx.) | 0.5 kg; 1.1 lb | 2.5 kg; 5.5 lb | 3.6 kg; 7.9 lb |
| Optional transducer ext. cable | OPC-1929 (6 m; 19.7 ft) | OPC-1929 (6 m; 19.7 ft) | OPC-1929 (6 m; 19.7 ft) |