AIS Aids to Navigation
MANDO series

AMEC MANDO-301/-303 is an AIS AtoN (Aids to Navigation) equipment developed with modern AIS technology that provides accurate and real time information to nearby vessels and shore stations. MANDO-301 is a type 1, and MANDO-303 is a type 3 model.

Use of Mando series AIS as an AtoN can provide following services (but not limited) to AIS equipped vessels and/or AtoN authority:

- Provide identification of the AtoN in all weather conditions;
- Transmit accurate positions of floating AtoN; indicate/track AtoN that is off position;
- Mark or delineate tracks, routes, areas, and limits (e.g., areas to be avoided or entry prohibited);
- Mark offshore structures such as wind turbines, wave and tidal energy devices, oil platforms, etc.
- Provide weather, tidal, and sea state data;
- Indicate/monitor real-time (or near real-time) information on the operation status of an AtoN or other support equipment at site;
- Provide additional AtoN capability through use of virtual AIS AtoN where installation of physical AtoN is technically or economically difficult.

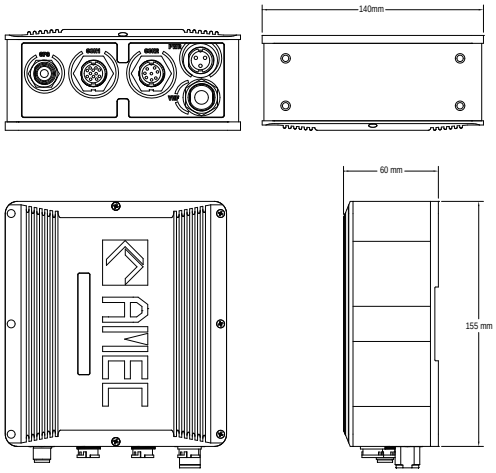
Key Features

- Fully compliant with IALA , IEC, and ITU standards with BSH/CE/FCC/USCG approval
- Support messages 21, 6, 7, 8, 12, 13, 14, 25
  (depends on hardware & software configuration)

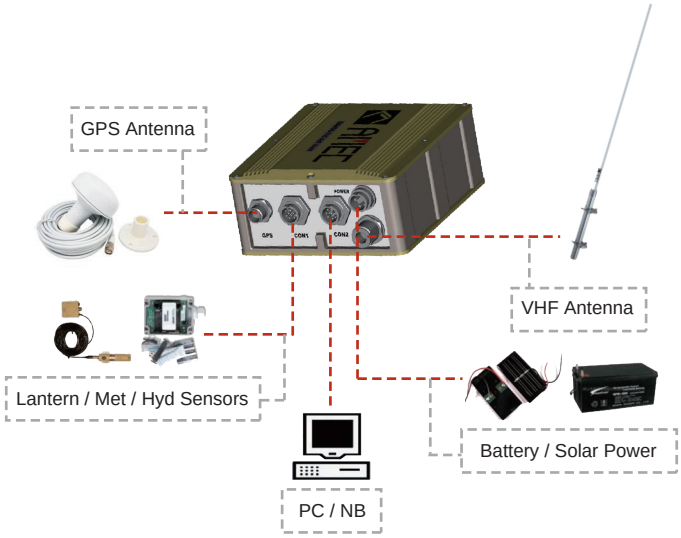
- Support meteorological & hydrological message (Message 8)
- Support synthetic and virtual AIS AtoN
- Support chaining and RATDMA (MANDO-303 only)
- Low power consumption & robust housing (IP67)

- Slim PCB module to integrate with lantern
- Supplied with user-friendly Windows-based configuration tool

DIMENSIONS



CONNECTION DIAGRAM



SPECIFICATIONS

APPLICABLE STANDARDS

IALA A-126 Ed.1.4 (2008-06)	IEC 61162-1 Ed.3 (2007-04)
IEC 60945 Ed.4 (2002-05)	IEC 62320-2 Ed.2:2016
IEC 61108-1 Ed.2 (2003-07)	ITU-R M.1371-4 (2010-04)

GPS RECEIVER

Receiving Channels	50 channels
Tracking & Navigation Sensitivity	≧ -159 dBm
Reacquisition Sensitivity	≧ -159 dBm
Horizontal Position	＜ 2.5 m Autonomous
	＜ 2.0 m SBAS
Receiver Type	SBAS: WAAS, EGNOS
	MSAS, GAGAN

TRANSMITTER PERFORMANCE

TX Frequency Range	156.025 MHz ~ 162.025 MHz
Frequency Accuracy	±500 Hz
Channel Space	25 KHz
Channel Protection	1 Sec max on air
Modulation	GMSK / FM
Data Rate	9,600 bps
TX Power Control	2 / 5 / 12.5 Watt (programmable)
Carrier Power Error	±1.5 dB (normal)
Nominal Impedance	50Ω

RECEIVER PERFORMANCE (MANDO-303 only)

Numbers of Receivers	2
RX Frequency Range	156.025MHz ~ 162.025 MHz
Sensitivity	PER 20% at -107 dBm
Data Rate	9,600 bps
PER	20% at -107 dBm
Co-Channel Rejection	10 dB at 1 KHz offset
Adjacent Channel Rejection	70 dB at 25 KHz
Nominal Impedance	50Ω

POWER SUPPLY

Supply voltage	12V DC nominal (at power connector)
Supply voltage range	9.6 ~ 15.6V DC

POWER CONSUMPTION @ 12V DC

MANDO-301	FATDMA ＜ 0.288 Ah/day *
MANDO-303	FATDMA ＜ 0.432 Ah/day *
	RATDMA ＜ 1.656 Ah/day *

*At 12.5W; transmission scheduled every 3 min

ENVIRONMENTAL

Operating Temperature	-20℃ ~ +55℃
Storage Temperature	-30℃ ~ +70℃
Humidity	95% relative humidity at 40℃

CONNECTION INTERFACE

Name	Type	Description
CON1	LTW 12 pins	One RS-232 as communication port Four analog-in (ADC) 0~36V One 1_PPS GPS output
CON2	LTW 8 pins	One RS-232 as configuration port One digital-in (High>5V Low<5V) One Relay (N.O. or N.C.)
PWR	LTW 3 pins	Power supply 12 VDC
VHF	SO-239 (Female)	To external VHF antenna
GPS	TNC	To external GPS antenna

SOFTWARE TOOL

AMEC AtoN Configuration	PC configuration utility

Note: Specifications are subject to change without prior notice.

AMEC
The AIS Specialists

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