

Yacht Devices

User Manual

Alarm Button YDAB-01

also covers models

YDAB-01N, YDAB-01R

Firmware version

1.11

2024

© 2022 Yacht Devices Ltd. Document YDAB-01-003. July 23, 2024. Web: <http://www.yachtd.com/>

NMEA 2000® is a registered trademark of the National Marine Electronics Association. SeaTalk NG is a registered trademark of Raymarine UK Limited. Garmin® is a registered trademark of Garmin Ltd.

Contents

Introduction	4
Warranty and Technical Support	5
I. Specification	6
II. Device overview	8
III. Device Installation and Connection to NMEA 2000	13
IV. Configuration with External Button	16
V. Device Configuration with an Installation Description Field	17
VI. Control from a MFD with CZone Support	27
VII. Built-in LED Signals	28
VIII. Firmware Updates	29
Appendix A. Troubleshooting	31
Appendix B. List of Sound Signals	34
Appendix C. List of External LED Signals	36
Appendix D. Engine and Transmission warnings	38
Appendix E. NMEA 2000 Messages	39

Package Contents

Device	1 pc.
This Manual	1 pc.
Button with Integrated LED	1 pc.
Sound Speaker 10W 4 Ohm	Not supplied
NMEA 2000 Cable	Not supplied

Introduction

Alarm Button (hereinafter Device) is a multifunctional NMEA 2000 device with wires for connection of an external button with LED indicator (supplied with the Device) and a standard 4 or 8 Ohm sound speaker (not supplied). It can be configured for the following functions:

- **MOB Alarm (default mode).** Press and hold the external button for 2 seconds to trigger a sound alarm and send NMEA 2000 AIS MOB messages (emulating the MOB alerts received from EPIRB and SART devices by NMEA 2000 AIS VHF) with the current GPS position. It sets the mark of MOB position on a chart plotter. Press the button for a second time to cancel alarm and stop transmission of MOB messages. Note that messages sent by the Device are not transmitted externally via VHF or AIS, but will be available to all NMEA 2000 devices on the vessel.
- **Digital Switching Alarm.** Device acts as an NMEA 2000 binary switch bank with 28 channels, each channel has a unique sound alarm and LED flashing sequence. Channels (and corresponding sound alarms) can be turned ON or OFF from other equipment, including our smart sensors, our YDNB-07 Bridge, or from the screen of a modern chart plotter. Press the external button to cancel alarms.
- **Engines Alarm.** In this mode Device monitors NMEA 2000-integrated engines status and parameters and triggers an alarm upon reception of engine warning flags or if certain engine parameter goes out of range. This mode is very useful if an existing engine instrumentation does not produce an audible alarm or is broken.
- **Anchor Alarm.** In this mode Device can be armed to monitor current vessel position and if position is outside of the specified radius for certain period of time or vessel's position data is lost will activate a corresponding alarm.

Device mode and audio signal level can be configured via external button. More settings can be configured with commands sent to the Device via the installation description strings (hardware and software from Yacht Devices, ActiSense or Maretron is required).

The Device has a built-in a 10 Watt audio amplifier and current consumption during the audio playback may exceed 1 Ampere. Therefore, it is recommended to connect the Device near the NMEA 2000 power cable or connect an additional power cable to the backbone socket next to the Device.

Thank you for purchasing our product and happy voyages!

Warranty and Technical Support

1. The Device warranty is valid for two years from the purchase date. If the Device was purchased in a retail store, the sale receipt may be requested when applying for a warranty claim.
2. The Device warranty is terminated in case of Manual instructions violation, case integrity breach, or repair or modification of the Device without manufacturer's written permission.
3. If a warranty request is accepted, the defective Device must be sent to the manufacturer.
4. The warranty liabilities include repair and replacement of the goods and do not include the cost of equipment installation and configuration, neither shipping the defective Device to the manufacturer.
5. Responsibility of the manufacturer in case of any damage as a consequence of Device operation or installation is limited to the Device cost.
6. The manufacturer is not responsible for any errors and inaccuracies in guides and instructions of other companies.
7. The Device requires no maintenance. The Device's case is non-dismountable. In the event of a failure, please refer to Appendix A before contacting technical support.
8. The manufacturer accepts applications under the warranty and provides technical support only via e-mail or through authorized dealers.
9. Manufacturer`s contact details and a list of the authorized dealers are published on the website: <http://www.yachtd.com/>.

I. Specification

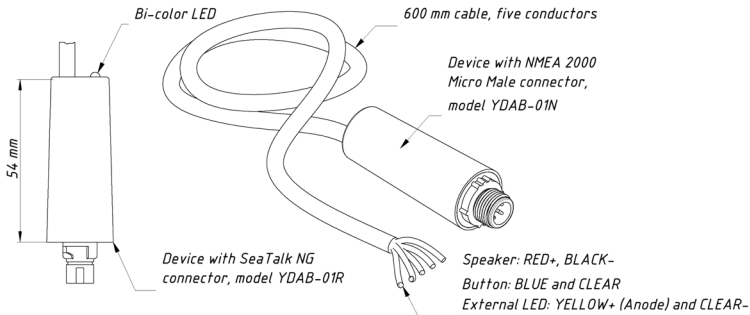


Figure 1. Drawing of YDAB-01N and YDAB-01R models of Device

Our devices are supplied with different types of NMEA 2000 connectors. Models containing an «R» in the suffix of the model name are equipped with NMEA 2000 connectors and are compatible with Raymarine SeaTalk NG. Models containing «N» in the suffix are equipped with NMEA 2000 Micro Male connectors.

Device cable has five wires to connect the sound speaker (not supplied with the Device) and an external push button with integrated LED.

Device parameter	Value	Unit
Power supply voltage, from NMEA 2000 network	7..16	V
Reverse polarity protection (power supply)	Yes	—
Average current consumption without playback	50	mA
Average current during playback (sound 1, Appendix B; 13V / 4 Ohm)	200	mA
Maximum current during playback (sound 23, Appendix B; 13 V / 4 Ohm)	440	mA
Recommended speaker impedance	4..8	Ohm
Audio amplifier output (8 Ohm load at 13V)	10	W
Load Equivalency Number	20	LEN
Built-in current limiting resistor for the external LED	200	Ohm
External LED power supply	3,3	V
Operating temperature range	-40..+80	°C
Weight	37	g
Device case length (without connector)	54	mm
Cable length	400	mm



Yacht Devices Ltd declares that this product is compliant with the essential requirements of EMC directive 2014/30/EU and radio and TTE directive 1999/5/EC.



Dispose of this product in compliance with the WEEE Directive or local regulations. Do not dispose of it with household or industrial waste.

II. Device overview

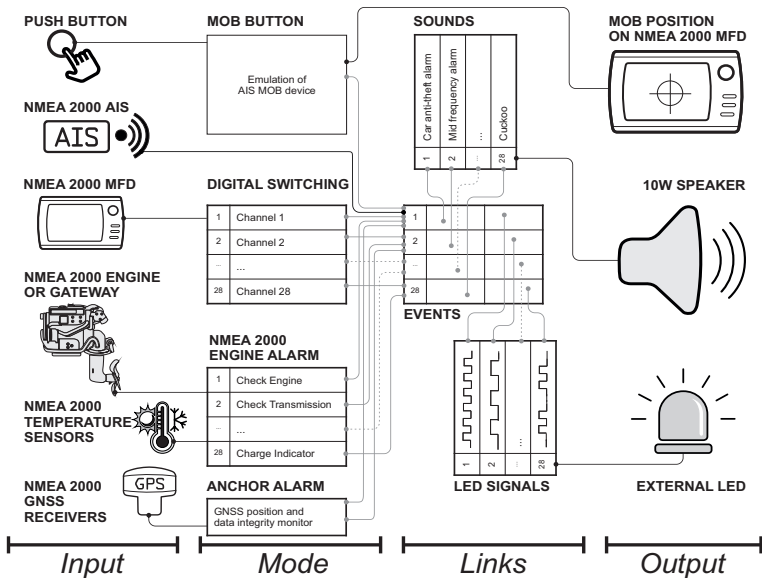


Figure 2. Functional scheme

Device can function in one of four different modes: MOB Alarm, Digital Switching Alarm, Engine Alarm, Anchor Alarm.

1. MOB Alarm mode

This mode is factory default. Press and hold external button for two seconds (button hold time can be changed in settings) and Device will start sending NMEA 2000 MOB messages (PGNs 129038, 129802 and 127233), using current GNSS position data received from NMEA 2000 network. Multifunction displays, chartplotters or navigational software (Expedition, OpenCPN) will place MOB mark on the chart, most of the displays also will show popup MOB warning. In addition to that, Device will play a sound alarm (Sound 1, or custom sound, linked with Event 1) and the external LED will start flashing, confirming that MOB alarm is activated. Press the button again to cancel MOB alarm and stop sending MOB PGNs.

For the MOB mark, Device uses MMSI number 972777XXX, where XXX is an incremental number from 000 to 999. This allows to set a new MOB mark next time when the previous MOB alert from the Device has been cancelled or suppressed by the MFD user. Incrementation is used, because some plotters (for example, Raymarine) do not react on MOB message if MOB Event with the same MMSI number has being already received but was cancelled earlier.

Unlike a VHF distress button or activation of EPIRB, the signal is not sent out from the boat. The main purposes of the Alarm Button are to wake up your crew with a sound alarm and place the MOB position on all chart plotters on board. Device is essential for you if you have no chart plotter near the helm, or if your MFD has no hardware MOB button and you need it to comply with racing rules.

MOB alarm on the Device can be activated not only by external button, but also by MOB PGNs received from a NMEA 2000 AIS unit or chartplotter: PGN 127233 – «Man Overboard Notification (MOB)», PGN 129038 – «AIS Class A Position Report» (with data field «Navigational Status» = 14 «AIS SART active» and/or 15 «AIS SART under test»), PGN 129802 – «AIS Safety Related Broadcast Message» (with data field «Safety Related Text» = «SART_ACTIVE» or «MOB_ACTIVE» or «EPIRB_ACTIVE») and Raymarine proprietary PGN 65288 «SeaTalk Alarm» (with «alarm ID» = 38, MOB).

Reaction on each PGN (127233|129038|129802) can be switched ON/OFF via YD:MOB_SRC command. Reaction to «AIS SART under test» messages can be also switched ON or OFF via YD:MOB_TEST command. (see Section V).

You can also force the Device to react only to MOB PGNs with a specific MMSI numbers, included in a custom list of your own EPIRB/MOB devices via YD:LIST command (see Section V). By default, Device will react to any MMSI.

2. Digital Switching Alarm mode

NMEA 2000 Digital Switching feature allows to control (e.g. switch ON or OFF) various loads from a chartplotter or software. For example, using a virtual button on the chart plotter screen you can turn navigation lights or a bilge pump ON or OFF.

In this mode, Device allows you to turn ON and OFF any of its 28 internal «virtual» digital switching channels from the chart plotter or from other digital switching equipment or software. Channels can be managed by NMEA 2000 digital switching messages (PGN 127501 and 127502) or with proprietary CZone messages (supported in most modern chart plotters, see the Section VI).

In NMEA 2000, digital switching devices are identified on the network by their bank number (can be changed with YD:BANK command, see Section V). Channels on devices with the same bank number will be turned ON or OFF synchronously by external equipment, this allows simultaneous activation of multiple Alarm Buttons with the same function installed at different places on the boat.

Temperature, pressure and humidity sensors from Yacht Devices can be set up to turn target digital switching equipment channels ON or OFF when the measured value is too high or too low. For example, the Digital Thermometer can trigger an alarm on the Alarm Button when the temperature in an engine room or live well is too high.

Our NMEA 2000 gateways with web-gauges interface (YDWG-02, YDEN-02, YDNR-02) allow to control Device's digital switching channels via web browser; you can trigger an alarm remotely, say, from the cockpit, to notify the crew or scare a thief remotely if a connection to the NMEA 2000 network over the Internet is deployed.

Our YDNB-07 Bridge can be used to implement complex digital switching rules, it can be programmed to trigger any of the 28 alarms upon certain conditions are met, for example, Bridge can monitor depth and trigger an alarm if depth value is lower than set threshold.

3. Engine Alarm mode

In this mode, Device will activate various alarms upon reception of engine and transmission warnings (via PGNs 127489 and 127493). You can also set up the Device to activate alarms on abnormal values of engine revolutions, coolant temperature, oil and boost pressure. For example, you can program Device to activate an alarm when engine revolutions exceed 3000 RPM for 30 seconds or more.

List of supported engine and transmission warnings is available in Appendix D. One Device can handle all engines, or you can link it to a particular engine by setting target NMEA 2000 «Engine Instance». For example, you can use two separate Devices (each one with its own dedicated speaker), one locked to PORT engine and another locked to STBD engine. Also, you can set up the Device to trigger an alarm upon reception of abnormal temperature from an external NMEA 2000 temperature sensor via PGNs 130312 «Temperature» and PGN 130316 «Temperature, Extended Range», with «Temperature Source» = 3 «Engine Room» and 14 «Exhaust Gas». Those sensors should have the same «Temperature Instance» as monitored «Engine Instance».

4. Anchor Alarm mode

In this mode, Device can be armed to monitor vessel GNSS position (received via PGNs 129029 and 129025, with 129029 data used with higher priority). If the position is detected to be outside of the set radius or if GNSS data are lost for a set timeout interval, a corresponding alarm Event will be activated.

To arm the Device, press and release the button. If you got valid GNSS position data in NMEA 2000, Device will be armed and its LED will shine constantly. If vessel position is detected to be outside of the set radius, Event 1 will be triggered: linked sound will play and linked LED indication sequence will be shown. If NMEA 2000 GNSS position data will be lost or becomes invalid for more than set interval, Event 2 will be triggered: linked sound will play and linked LED indication sequence will be shown. To disarm or cancel an active alarm Event press and release the button.

5. Raymarine SeaTalk alarms

Device also can receive and process proprietary Raymarine SeaTalk Alarm messages (PGN 65288) sent by Raymarine equipment. By default, processing of SeaTalk Alarms is disabled, except alarm ID 38 «MOB» in MOB mode. You can enable and arbitrarily map SeaTalk alarm IDs to Events using command YD:ALARM (see Section V).

6. Events, channels, sounds, flash sequences and links between them

You can configure sound alarms and external LED signals linked to different Events. In MOB mode, only the Event with number 1 is used. In Anchor Alarm mode, only Events 1 and 2 are used. In other modes, all 28 Events (with numbers from 1 to 28) are linked to 28 digital switching channels or 28 supported engine and transmission warnings.

The Device NVRAM contains 28 pre-recorded sound signals (see the Appendix B) and 28 LED flashing sequences (see the Appendix C). In factory default settings, the sound signal number 1 and flashing sequence number 1 are linked to Event 1 and so on. You can also upload 4 custom sound signals into slots 25..28 (see Section V).

You can listen to sounds and look at LED flashing sequences using YD:PLAY and YD:LED commands and set desired sound and flashing sequence for each Event using YD:LINK command (see the Section V). To disable or enable the Event use YD:EVENT command.

If different Events occur at the same time, Events with lowest number will have highest priority, Device will play sound and show LED flashing sequence linked with this Event.

In Engine Alarm mode, pressing the button will suppress the current Event for 30 seconds (time can be changed in settings) for all engines. If multiple engine warnings occurs at the same time, the next Event will be activated.

In digital switching mode, external button either turns channel 1 ON/OFF (channel number can be changed in settings) or if multiple channels were already turned ON, each button press will turn OFF an active channel, in order from lowest to highest priority.

For example, if you turn ON channels 1, 2 and 4 from external digital switching control equipment, Device will play the sound and show LED sequence corresponding to the Event 1. When you press the button, channel 1 will be turned OFF and the Device will play the sound and show LED sequence corresponding to the Event 2. Next button press will turn OFF channel 2 and Device will play the sound and show LED sequence corresponding to the Event 4. Next button presses will turn OFF channel 4.

III. Device Installation and Connection to NMEA 2000

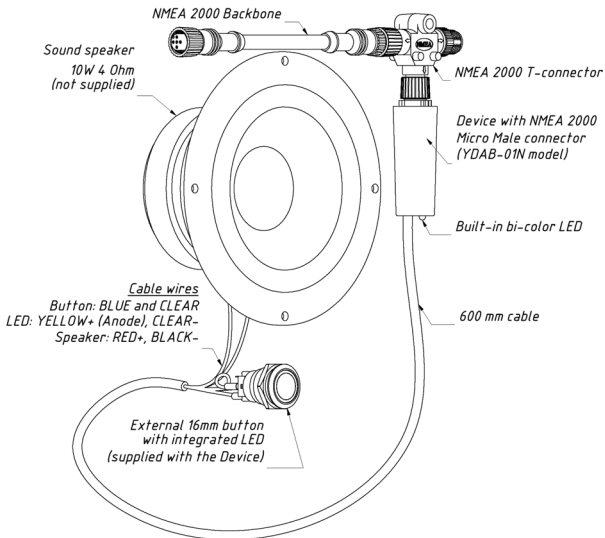


Figure 3. Device connection

Device requires no maintenance. When deciding where to install Device, choose a dry mounting location. Avoid places where the Device can be flooded with water, this can damage it.

1. Connecting to NMEA 2000

Device can be directly plugged into to the network backbone connector. YDAB-01N model can also be connected via standard «DeviceNet NMEA 2000 Micro» drop cable. Before connecting the Device, turn OFF the bus power supply. Refer to the following documentation if you have any questions regarding the conenctors and other NMEA 2000 backbone components installation requirements:

- SeaTalk NG Reference Manual (81300-1) for Raymarine networks.
- Technical Reference for Garmin NMEA 2000 Products (190-00891-00) for Garmin networks.

Note that Device is powered from the NMEA 2000 backbone and consumes up to 1 Ampere during the playback, thus it is recommended to conenct the Device close to the NMEA 2000 power cable or add an extra power cable and T-piece near the connection point.

After connecting the Device, close the NMEA 2000 connector lock to ensure its water resistance and reliability. Device has a built-in LED which flashes red or green. After powering NMEA 2000 network ON, Device's built-in LED will start flashing (see Section VII).

2. Connection of the external button and LED

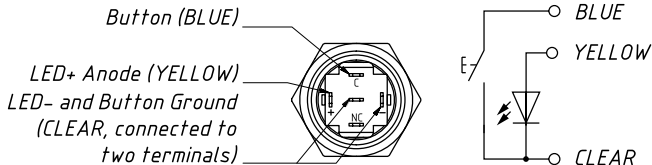


Figure 4. Button terminals and electrical scheme

You can use supplied button or any momentary push-button you like that matches your boat's interior. Waterproof IP67 buttons of this type with integrated LED of various colours are widely available from well-known international suppliers like DigiKey Electronics (www.digikey.com), Mouser Electronics (www.mouser.com) and others. For example, Mouser part number 123-82-4151.1153 is an IP67 stainless steel 16mm momentary push-button with white ring illumination (LED 12V, AC/DC).

Device provides 3.3 Volts to the external LED wire (YELLOW) and has a 200 Ohm built-in current-limiting resistor (you can connect the LED directly to wires). Buttons with LEDs rated for 12 Volt will be brighter than buttons rated for 24 Volt (actually they differ by current-limiting resistor inside). Buttons with LED rated for 5 Volt and 3.3 Volt are recommended, also widely available.

YELLOW wire of the Device must be connected to LED's anode «+», the BLUE wire must be connected to the button, CLEAR wire must be shared between the LED's cathode «-» and the second button terminal. Terminals of the button supplied with the Device are shown in Figure 4. It is mandatory to crimp contacts, soldering is optional. Soldering joints must be protected from the environment with paint or lacquer.

3. Connection of the sound speaker

Device has a built-in 10 Watt audio amplifier and can output current up to 1 Ampere. The best performance will be achieved with 4 Ohm speakers, the 8 Ohm speaker will sound a little quieter. Piezoelectric sound emitters can also be used, but they may have adequate performance with tonal signals only.

Device's RED wire should be connected to the «+» terminal of the speaker, and BLACK wire should be connected to the «-» terminal of the speaker (see Figure 3). Sound volume can be adjusted (see Sections IV and V).



Note that Device audio amplifier power rails are directly connected to NMEA 2000 power rails – Device audio output is not galvanically isolated from NMEA 2000 power. Therefore, do not connect any other equipment to Device audio output and make sure that speaker cable is routed well in a way that prevents its accidental short (between wires themselves or to the vessel's common ground).

For maximum possible NMEA 2000 power short protection connect Device to backbone via «NMEA 2000 power isolator» tee (e.g. Garmin part number 010-11580-00) and power the Device from a separate NMEA 2000 power cable with dedicated fuse.

IV. Configuration with External Button

Configuration with the external button is limited and allows to change volume and set Device operation mode (see the Section II). To enter configuration mode:

- in MOB button mode: quickly press the button 5 times;
- in other modes: hold the button for 5 seconds.

Device confirms entering the configuration mode with a 5-second long signal of the external LED. Press the button once during that LED signal to enter mode programming, or wait until the Device enters volume programming after that LED signal.

In mode programming, external LED will continuously flash, depending on the current mode:

- 1 short flash with a short delay: MOB button mode;
- 2 short flashes: digital switching mode;
- 3 short flashes: engine alarm mode;
- 1 short flash with a long delay: anchor alarm mode.

In the volume programming:

- 1 short flash: 1% of volume;
- 2 short flashes: 20% of volume;
- 3 short flashes: 40% of volume;
- 1 long flash: 60% of volume;
- 2 long flashes: 80% of volume;
- 3 long flashes: 100% of volume.

Press the button to cycle between modes or volume levels.

To apply settings, do not press the button for 10 seconds, Device will save current settings and return to normal operation mode.

V. Device Configuration with an Installation Description Field



Configuration of the Device should not be performed at sea.

NMEA 2000 «Installation Description» data fields are stored in the Device's memory and are usually written by installers to specify the device location or to leave notes or contact information. They can be set with a PC software and a hardware gateway to the NMEA 2000 network. Some models of NMEA 2000 display devices may also allow editing of installation description data fields. Please refer to your software or chart plotter documentation for details.

Device Properties

Address Claim		Product Information	
Address	67 <input type="text"/> HEX: 43 <input type="text"/>	Database version	2.100 <input type="text"/>
	<input type="button" value="Update"/>	Product code	0 <input type="text"/>
Unique number	220135 <input type="text"/>	Model version	Alarm Button / YACHTD.COM <input type="text"/>
Manufacturer code	717 <input type="text"/>	Model ID	YDAB-01 <input type="text"/>
Device instance	0 <input type="text"/>	Software version	1.08b 15/07/2021 <input type="text"/>
System instance	0 <input type="text"/>	Serial	00220135 <input type="text"/>
Class / function	120 / 140 <input type="text"/>	Certification	Not applicable <input type="text"/>
Industry	4: Marine <input type="text"/>	LEN (mA)	20 [1000 mA] <input type="text"/>
Self-configurable	Yes <input type="text"/>		
	<input type="button" value="Update"/>		
Configuration Information		Heartbeat	
Installation description 1	<input type="text"/>	<input checked="" type="checkbox"/> CAN1 <input type="checkbox"/> CAN2 <input checked="" type="checkbox"/> Equipment	
Installation description 2	YD:DEV 1 <input type="text"/>	Updated	00:20:26.912 <input type="text"/>
Manufacturer information	Yacht Devices Ltd., www.yachtd.com <input type="text"/>		
	<input type="button" value="Update"/>		
		<input type="button" value="Refresh"/>	<input type="button" value="More..."/>

Figure 5. Configuring the Device with CAN Log Viewer

To configure the Device, enter a special string starting with «YD:» to the «Installation description 2» data field in the Device properties. For example, «YD:DEV 1» (without quotes) will change the NMEA 2000 «Device Instance» of the Device to 1. If the command is accepted by the Device, it will add «DONE» to the entered text and «YD:DEV 1 DONE» will be displayed in return. If a command is entered without the last parameter, the Device replies with the current value of the parameter.

Figure 5 on the previous page shows the process of configuring the Device with our free CAN Log Viewer software (to open this window, select the item «NMEA 2000 Devices» in the «View» menu, refresh the list of devices, select the Device and click «Properties» button). You can download this program (runs on Microsoft Windows, Mac OS X and Linux) at <http://www.yachtd.com/downloads/>. Yacht Devices NMEA 2000 Wi-Fi Gateway or Yacht Devices NMEA 2000 USB Gateway is required to connect the PC to the NMEA 2000 network.

CAN Log Viewer also allows you to modify the NMEA 2000 «Device Instance» by entering a value in the dedicated field (see «Address Claim» group on Figure 5).

After entering the command as shown in Figure 5, click the «Update» button to apply changes, observe the value in the «Device Instance» field changed to 1, and «Installation description 2» field changed to «YD:DEV 1 DONE», indicating that the command was accepted and executed correctly.

If you want to replace built-in sounds with your own custom sounds you should have CAN Log Viewer version 1.30 or higher and Device firmware version 1.02 or higher. Click «More..» button at Properties page, and the «Sound Uploader» window will open (see Figure 6 below).

You can replace built-in sounds 25..28; other sounds (1..24) cannot be replaced. If you need to replace the sound for MOB Event 1, you can upload your custom sound file to slot 25 and link the sound 25 to Event 1 with command:

```
YD:LINK 1 SOUND 25
```

To upload new or replace an old sound select slot number, select audio file, and click «Upload file» button.

You can also adjust «Start delay» and «Replay delay» parameters (from 0.1 to 600 seconds with 0.1 second intervals) with «Update delays» button. For example, if you need a «fog horn» alarm where a 5-second signal should be automatically repeated each minute, set replay delay of 1 minute.

Note that sounds 25..28 cannot be restored to factory defaults with the «YD:RESET» command. You will need to re-upload original sounds again. Device firmware archive contains «SOUND» subfolder where copies of original sounds audio files are present. The last two digits in file name are the factory start delay and replay delay settings.

Device can accept audio files only in specific format — mono 16-bit PCM WAV files with sample rate of 22050 Hz, and length from 0.1 to 13 seconds (from 4 to 688 kBytes). Yes, the slot size is limited and you will not be able to upload your favourite MP3 track. But 13 seconds is enough for a long phrase.

We recommend free Audacity software to make audio files (<https://www.audacityteam.org/>) as it is free and can work on Windows, macOS and Linux. It allows clipping of files, adjusting the volume (Effect > Amplify...) and saving in various formats. Make sure to set the «Project Rate» to 22050 Hz and save the file of type «WAV Microsoft signed 16-bit PCM».

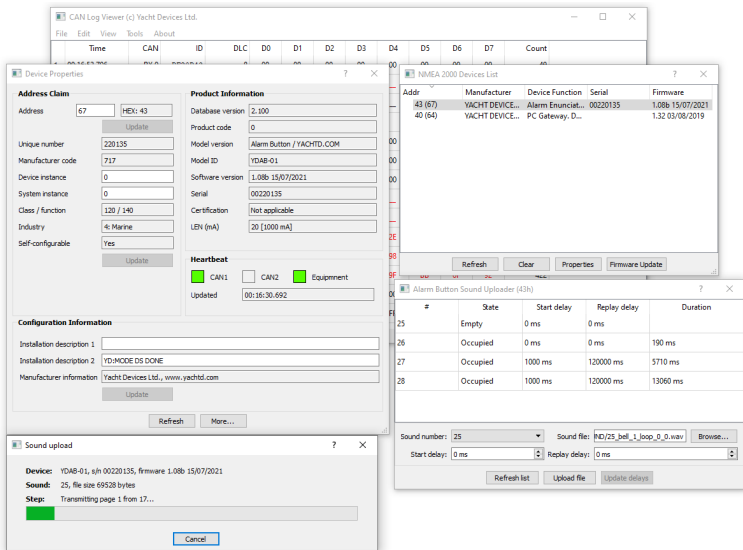


Figure 6. Audio files uploading

Full list of commands is given in Table 1. Parameters in square brackets can be omitted to get the current setting values.

Table 1. list of supported «YD commands».

String format	Examples	Description
<i>System commands</i>		
YD:RESET		Reset all settings to factory defaults.
YD:DEV [0..255]	YD:DEV 0	Set NMEA 2000 «Device Instance» value (0 - 255). Factory setting 0.
YD:SYS [0..15]	YD:SYS 0	Set NMEA 2000 «System Instance» value (0 - 15). Factory setting 0.
YD:PGN <pgn> [interval OFF]	YD:PGN 126993 60000 YD:PGN 127501 2000	Set transmission interval for PGN 126993 (Heartbeat) or 127501 (Binary Status Report) in milliseconds. Values from 50 to 60 000 (1 minute) are allowed. OFF or 0 disables PGN transmission.
<i>Commands available in all modes</i>		
YD:MODE [MOB DS ENGINE ANCHOR]	YD:MODE MOB YD:MODE DS YD:MODE ENGINE YD:MODE ANCHOR	Set operation mode. Device will be rebooted after two seconds. Factory setting is MOB. Note, that NMEA 2000 device class and function will be changed after reboot, and you may need to refresh NMEA 2000 devices list in the software or on a chartplotter.
YD:PLAY [0..28]	YD:PLAY 1	Play sound of specified number (1 - 28) or stop playback (0). See Appendix B.
YD:LED [0..28]	YD:LED 1	Show external LED indication sequence of specified number (1 - 28) or stop LED indication (0). See Appendix C.
YD:STOP		Stop playback and external LED indication.

Table 1 continued

String format	Examples	Description
YD:VOLUME [0..100]	YD:VOLUME 100	Set sound volume in percent, 0 turns off all sound signals.
YD:LINK <1..28> <SOUND LED> [1..28]	YD:LINK 1 SOUND 1 YD:LINK 2 LED 2 YD:LINK 2 LED	Link specified sound or LED indication sequence with the Event. In MOB mode, only the Event number 1 is used. One sound or sequence can be linked with multiple Events. You can also query current setting as shown in third example.
YD:EVENT <1..28> <OFF ON>	YD:EVENT 3 OFF	Enable or disable the Event with specified number. This setting is ignored in the MOB and Anchor Alarm modes.
YD:INTERVAL <1..28> [0..6000.0]	YD:INTERVAL 1 0.5 YD:INTERVAL 3 60	Set interval (in seconds, second parameter) between sound playbacks for specified event. One sound can be linked with multiple Events.
YD:ALARM [<1..28> [NONE 1..252]] <CLEAR>	YD:ALARM 3 37 YD:ALARM CLEAR	Incoming Raymarine «SeaTalk Alarm» PGN 65288 processing rules. First parameter — event number (1–28), second — SeaTalk Alarm ID (1–252). By default, processing of all SeaTalk alarms are disabled, except alarm ID 38 «MOB» in MOB mode.
<i>MOB mode commands</i>		
YD:MOB [TEST ACTIVE]	YD:MOB TEST	Set MOB type text for messages sent by the Device. Note that messages sent from Device are not transmitted externally via VHF or AIS. Both types are displayed in the same way on chart plotters, the difference is only in the text displayed.

Table 1 continued

String format	Examples	Description
YD:HOLD [1..10]	YD: HOLD 2	Set button hold time required for MOB activation, in seconds.
YD:DURATION [OFF 0..600]	YD:DURATION 10	Set sound playback duration, in seconds. 0 value or OFF sets perpetual playback.
YD:LIST [mmsi] [...]	YD:LIST 338064000 338064001 338064002 YD:LIST CLEAR	Set list of MMSI numbers for incoming MOB PGNs. Device will react only on messages containing these numbers. Use command «YD:LIST CLEAR» to empty this list (when empty, Device reacts on any MMSI).
YD:MOB_SRC [decimal PGN number] ON OFF	YD:MOB_SRC 129038 OFF YD:MOB_SRC 129802 ON	Enable or disable reaction on incoming MOB PGNs 129038, 129802 or 127233 (by default all enabled).
YD:MOB_TEST [OFF ON]	YD:MOB_TEST ON YD:MOB_TEST OFF	Enable or disable reaction on incoming test MOB PGNs (enabled by default).
<i>Digital switching (DS) mode commands</i>		
String format	Examples	Description
YD:BANK [0..252]	YD:BANK 0	Set the DS bank number, factory setting 0.
YD:OFF <1..28> YD:ON <1..28> YD:TOGGLE <1..28>	YD:OFF 1 YD:ON 2 YD:TOGGLE 2	These commands change specified DS channel state.
YD:CHANNEL [OFF 0..28]	YD:CHANNEL 3	Select which channel (and corresponding Event) will be activated when external button is pressed. If 0 or OFF value is specified, the button will only switch active channels (and corresponding Events) OFF..

Table 1 continued

String format	Examples	Description
YD:MARETRON [OFF ON]	YD:MARETRON OFF	Enable or disable compatibility mode with Maretron digital switching.
YD:CZONE [ON OFF AUTO]	YD:CZONE ON YD:CZONE AUTO YD:CZONE OFF YD:CZONE	Factory setting: AUTO. Activates features required to control loads from chart plotters with CZone support. See Section VI for details.
<i>Engine mode commands</i>		
YD:ENGINE [ANY 0..252]	YD:ENGINE ANY YD:ENGINE 1	Select «Engine Instance» to monitor. PORT engine has instance 0, instance should be incremented by one moving from port to starboard, bow to stern. Factory default setting is ANY.
YD:SUPPRESS [1..100000]	YD:SUPPRESS 3600	Button press suppresses the active Event for specified number of seconds. Factory default setting is 30.
YD:COOLANT [OFF 0..600 0..600]	YD:COOLANT 300 60 YD:COOLANT OFF	Turn ON Event 6 «Over Temperature» when coolant temperature is above the specified temperature in Celsius (first parameter) during specified number of seconds (second parameter, 0 – turns the Event ON immediately). Factory default setting is OFF.
YD:TR_TEMP [OFF 0 ..600 0..600]	YD:TR_TEMP 200 1 YD:TR_TEMP OFF	The same as above, but for transmission oil temperature, turns on Event 6 «Transmission: Over Temperature».

Table 1 continued

String format	Examples	Description
YD:RPM [OFF 0..20000 0..600]	YD:RPM 3500 180 YD:RPM OFF	Turn ON Event 18 «Revolutions Limit Exceed» when engine revolutions are above value specified in the first parameter during specified number of seconds (second parameter, 0 – turns the Event ON immediately). Factory default setting is OFF.
YD:BOOST [OFF 0..6553 0..600]	YD:BOOST 1000 0 YD:BOOST OFF	Turn ON Event 14 «High Boost Pressure» when the absolute boost pressure in kPa is above value specified in the first parameter during specified number of seconds (second parameter, 0 – turns the Event ON immediately). Factory default setting is OFF.
YD:OIL_PRES [OFF 0..6553 0..600]	YD:OIL_PRES 100 0 YD:OIL_PRES OFF	Turn ON Event 9 Low Oil Pressure when the engine oil pressure is below value specified in the first parameter during specified number of seconds (second parameter, 0 – turns the Event ON immediately). Can be triggered only if RPM>100 for more than 5 seconds. Factory default setting is OFF.
YD:EXHAUST [OFF <0..10000 0..600>]	YD:EXHAUST 350 1 YD:EXHAUST OFF	Turn ON Event 26 when the Exhaust Gas temperature in °C is above value specified in the first parameter during specified number of seconds (second parameter, 0 turns Event ON immediately). Factory default setting is OFF.

Table 1 continued

String format	Examples	Description
YD:ENG_ROOM [OFF <0..10000 0..600>]	YD:ENG_ROOM 75 20 YD:ENG_ROOM OFF	Turn ON Event 27 when the Engine Room temperature in °C is above value specified in the first parameter during specified number of seconds (second parameter, 0 turns Event ON immediately). Factory default setting is OFF.
<i>Anchor alarm mode commands</i>		
String format	Examples	Description
YD:ANCHOR [1..1000 [0..600 [1..60]]]	YD:ANCHOR 50 3 3 YD:ANCHOR 20 0 5 YD:ANCHOR 25 1 YD:ANCHOR 33	Sets up anchor alarm trigger conditions. First parameter sets radius from current position in meters, default 50 m. Second parameter sets for how many seconds the vessel position should be out of the radius before an alarm Event 1 is triggered (default 3 seconds). Third parameter sets for how many seconds the GNSS position can be lost before an alarm Event 2 be activated. Note that if third or second parameter is omitted, its value will not change.
YD:PERSISTENT [OFF ON]	YD:PERSISTENT OFF YD:PERSISTENT ON	Set to ON to store current position into Device's NVRAM when Anchor alarm is armed. This will allow Device to re-enter armed state even when NMEA 2000 power is lost and then restored. Factory default value is OFF, Device will store current position in RAM only and if NMEA 2000 power is cycled when the Device is armed, Device will fall back to disarmed state when NMEA 2000 power is restored.

VI. Control from a MFD with CZone Support

When Devcie is in Digital Switching mode, you can turn ON and OFF first 6 DS channels from most of modern chart plotters with CZone support. This includes Garmin, Lowrance, Simrad, B&G, Furuno chart plotters and recent models from Raymarine (Axiom, eS and gS series). Unfortunately, standard NMEA 2000 (PGN 127501/127502) messages are not supported by chart plotter manufacturers.



If you already have CZone equipment installed, you will overwrite the existing CZone configuration with our file and your CZone equipment will not function correctly.

In such cases you need to first get your current CZone configuration (ZCF file) and edit it, merging our configuration into it. Always keep original ZCF file so you can revert the changes if necessary.

You need to do the following; the process will take a minute:

1. Visit the product's page on our website and follow the link to related article.
2. Fill the form with the desired button names and download personalized configuration file for your MFD.
3. Turn on CZone support on your MFD and configure the Dip Switch setting (not required on Raymarine MFDs).
4. Import the configuration file to the MFD (usually, from microSD card).

The only exception is Furuno chart plotters. They support uploading of configuration file over NMEA 2000 network only. This can be done with our free CAN Log Viewer software (see Section V) connected to NMEA 2000 with one of our gateways (please see details at our web site).

Devcie has a setting which activates CZone support (see Section V). Factory default is AUTO, thus CZone support will be automatically activated on the Device after the configuration file downloaded from our web site is uploaded to the MFD.

VII. Built-in LED Signals

The Device is equipped with a two-color red/green LED that indicates the Device state. Signals of the external LED are described in Section IV and Appendix C.

Device emits a half-second GREEN flash after powering ON, indicating that it has successfully initialized. After initialization, Device emits three short (quarter of second) GREEN flashes indicating that it has successfully connected to the NMEA 2000 network.

If Device fails to get an NMEA 2000 address, it will constantly flash RED (one second flash with one second intervals).

1. Signals in MOB Alarm mode

Device built-in LED flashes once in two seconds: RED – no valid GNSS data received, GREEN – valid GNSS position was received within last 2 seconds.

2. Signals in Digital Switching mode

Device built-in LED flashes GREEN when it sends periodical PGN 127501 «Binary Status Report». Default interval is 2 seconds, can be changed in settings (see Section V).

3. Signals in Engine Alarm mode

Device built-in LED flashes once in two seconds: RED – no engine data received, GREEN – engine data was received in last 10 seconds.

4. Signals in Anchor Alarm mode

Device built-in LED flashes once in two seconds: RED – no valid GNSS data received, GREEN – valid GNSS position was received within the set GNSS data timeout interval (see Section V).

5. Signals during firmware update

Signals during firmware update are described in the next Section.

VIII. Firmware Updates

Firmware updates can be done with our free CAN Log Viewer software (version 1.28 or higher) running on Microsoft Windows, macOS or Linux:

http://www.yachtd.com/products/can_view.html

CAN Log Viewer must be connected to NMEA 2000 network with one of our NMEA 2000 gateways (YDWG-02, YDNU-02, YDNR-02 or YDEN-02).

Download the latest firmware file from our website:

<http://www.yachtd.com/downloads/>

Extract the YDAB01.BIN file from the archive. Check also the README.TXT file included in the archive, it may contain important information regarding the update.

1. Click «NMEA 2000 Devices» item in «View» menu.
2. Click «Refresh» button (see Figure 7 at the next page) in opened window and wait for YDAB-01 device to appear in the list. If all Device details are not loaded on the first try, click «Refresh» again.
3. Select YDAB-01 device in the list and click «Firmware Update» button.
4. Locate and select YDAB01.BIN file you have extracted earlier.
5. Wait while the firmware is uploading. If in doubt, see the video with the update procedure on our web site.

During the firmware upload, Device's status LED flashes RED very fast. When firmware is updated, Device status LED emits five RED half-second signals and CAN Log Viewer also informs you that an update is successfully done.

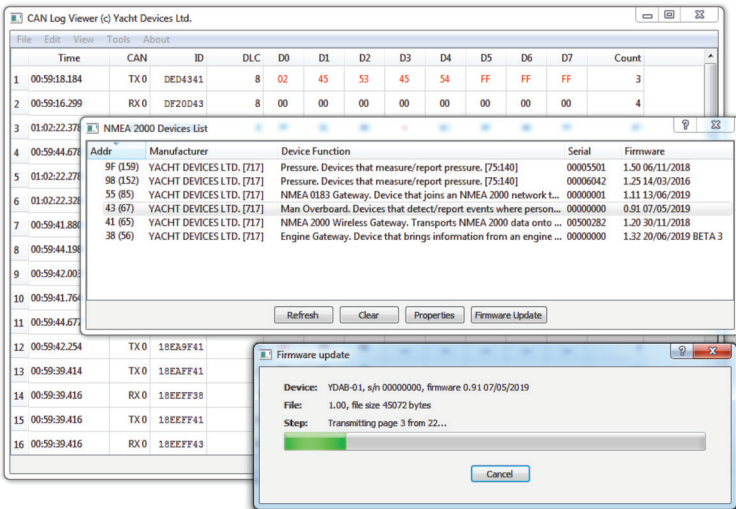


Figure 7. Firmware update of Alarm Button YDAB-01

Appendix A. Troubleshooting

Situation	Possible cause and actions
No built-in LED indication after the NMEA 2000 network is powered ON.	<p>1. No power supply on the bus. Check if bus power is supplied (NMEA 2000 network requires a separate power source connection and cannot be powered by a plotter or another device connected to the network).</p> <p>2. Loose connection in the power supply circuit. Treat the Device connector with a spray for cleaning electrical contacts. Plug the Device into another connector.</p>
Device built-in LED flashes every two seconds, but Device is not visible in the NMEA 2000 device list on a NMEA 2000 plotter/MFD/instrumental display.	<p>1. Bad connection between the Device and NMEA 2000 network. Check the Device NMEA 2000 connector for damage or corrosion, clean contacts with a spray for cleaning electrical contacts if necessary. Try to plug the Device to another «known good» NMEA 2000 connector or drop cable.</p> <p>2. Connectivity issue in the NMEA 2000 network. The network segment is not connected to the chart plotter or there are missing terminators in the network. Plug another «known good» device into the connector that was used for Device connection and check if it appears in the list of NMEA 2000 devices on the chartplotter/MFD/instrumental display.</p>
No sound	<p>1. Speaker is connected incorrectly. See section III. 3.</p> <p>2. Wiring issue. Check speaker wiring for a short or a bad contact.</p> <p>3. Speaker failure. Check speaker impedance with an ohmmeter.</p> <p>4. Sound volume is set to 0. Check and modify volume setting with an external button (see Section IV) or YD:VOLUME command (see Section V).</p>

Situation	Possible cause and actions
No external LED indication	<p>1. External LED is connected incorrectly. See section III. 2. Pay attention to LED polarity.</p> <p>2. Wiring issue. Check LED wiring for a short or a bad contact.</p> <p>3. LED failure. Check LED with a tester.</p>
External button does not work at all	<p>1. External button is connected incorrectly. See section III. 2.</p> <p>2. Wiring issue. Check button wiring for a short or a bad contact.</p> <p>3. Button failure. Check button with a tester.</p>
External button does not work as expected	<p>1. Wrong mode. Check current mode with an external button (see Section IV) or the YD:MODE command (see Section V).</p>
<p>MOB mode:</p> <p>Device activates MOB alarm when NMEA 2000 AIS is active but no AIS MOB marker is present on NMEA 2000 display device.</p>	<p>1. Device reacts to EPIRB test messages, received by AIS and transmitted to NMEA 2000. Either disable reaction to test messages with command YD:MOB_TEST OFF or allow reaction to AIS MOB received only with certain MMSI with command YD:LIST (see Section V).</p>

Situation	Possible cause and actions
<p>Digital Switching mode:</p> <p>Device does not work in sync with NMEA 2000 digital switching equipment in digital switching mode</p>	<p>1. Wrong bank. Check that NMEA 2000 digital switching equipment has the same bank. Reconfigure Device with YD:BANK command (see Section V).</p> <p>2. You are using Maretron NMEA 2000 digital switching equipment but the Maretron support is not enabled. Enable Maretron support with YD:MARETRON ON command (see Section V).</p> <p>3. You are using CZone NMEA 2000 digital switching equipment but the CZone support not enabled. Enable CZone support with YD:CZONE ON command (see Section V).</p>
<p>Engine Alarm mode:</p> <p>Device does not get engine data, built-in LED flashes red every 2 seconds</p>	<p>1. No engine data in NMEA 2000 network. Check that engine data is available on a NMEA 2000 network.</p> <p>2. Wrong «Engine Instance» setting. Check and modify monitored «Engine Instance» with YD:ENGINE command (see Section V).</p>
<p>Anchor Alarm mode:</p> <p>Device can not be armed, built-in LED flashes red every two seconds</p>	<p>1. Bad or missing GNSS position data. Check your GNSS sources, they should send valid position via PGNs 129029 «GNSS Position Data» or 129025 «Position, Rapid Update».</p>

Appendix B. List of Sound Signals

Number	Sound
1	Car anti-theft alarm
2	Mid frequency long alarm sound
3	Mobile phone vibration
4	Big ship horn
5	Sequence of four high frequency horn sounds
6	Sequence of two chimes (low to high frequency)
7	Sonar ping
8	Old telephone
9	High frequency beeper
10	Whistle
11	Sequence of two bell rings
12	Mechanical alarm clock
13	Engine order telegraph
14	Small ship horn
15	Mid frequency beeper
16	Car horn
17	Alien laser burst
18	Emergency vehicle siren (low to high frequency)
19	Sequence of two low frequency horn sounds

Number	Sound
20	Emergency vehicle siren (fast)
21	Emergency vehicle siren (slow)
22	Emergency vehicle siren (high to low frequency)
23	Square wave 2500 Hz
24	Emergency vehicle horn, alternating two tones
25	High frequency bell
26	Low frequency buzz (150 Hz)
27	Bicycle bell
28	Cuckoo

Appendix C. List of External LED Signals

Number	LED indication descriptions	LED indication description
1	One short flash, followed by short delay	100 ms ON, 400 ms OFF
2	Two short flashes, followed by short delay	100 ms ON, 150 ms OFF, 100ms ON, 400 ms OFF
3	Three short flashes, followed by short delay	100 ms ON, 150 ms OFF, 100ms ON, 150 ms OFF, 100ms ON, 400 ms OFF
4	One short flash, followed by long delay	100 ms ON, 1 s OFF
5	Two short flashes, followed by long delay	100 ms ON, 150 ms OFF, 100ms ON, 1 s OFF
6	Three short flashes, followed by long delay	100 ms ON, 150 ms OFF, 100ms ON, 150 ms OFF, 100ms ON, 1 s OFF
7	One long flash, followed by long delay	500 ms ON, 1 s OFF
8	Two long flashes, followed by long delay	500 ms ON, 250 ms OFF, 500 ms ON, 1 s OFF
9	Three long flashes, followed by long delay	500 ms ON, 250 ms OFF, 500 ms ON, 250 ms OFF, 500 ms ON, 1 s OFF
10	Blinking with short flashes	100 ms ON, 100 ms OFF
11	Blinking with intermediate flashes	500 ms ON, 500 ms OFF
12	Blinking with long flashes	1 s ON, 1 s OFF
13	Fast rising luminosity	400 ms rise time
14	Medium rising luminosity	1300 ms rise time
15	Slow rising luminosity	4 s rise time

16	Fast falling luminosity	400 ms fall time
17	Medium falling luminosity	1300 ms fall time
18	Slow falling luminosity	4 s fall time
19	Fast alternating luminosity	400 ms cycle
20	Medium alternating luminosity	1300 ms cycle
21	Slow alternating luminosity	4 s cycle
22	One short flash, followed by long delay	100 ms ON, 3 s OFF
23	One short flash, followed by very long delay	100 ms ON, 5 s OFF
24	One short flash, followed by extremely long delay	100 ms ON, 7 s OFF
25	One short flash, followed by one long flash	100 ms ON, 200 ms OFF, 400 ms ON, 200 ms OFF
26	Two short flashes, followed by two long flashes	[100 ms ON, 200 ms OFF] x2 times, [400 ms ON, 200 ms OFF] x2 times
27	Three short flashes, followed by three long flashes	[100 ms ON, 200 ms OFF] x3 times, [400 ms ON, 200 ms OFF] x3 times
28	SOS: Three short flashes, followed by three long flashes, followed by three short flashes	[100 ms ON, 200 ms OFF] x3 times, [400 ms ON, 200 ms OFF] x3 times, [100 ms ON, 200 ms OFF] x3 times

Appendix D. Engine and Transmission warnings

NMEA 2000 Engine Warning	Event	NMEA 2000 Engine Warning	Event
<i>Engine</i>		<i>Engine</i>	
Check Engine	1	Emergency Stop Mode	3
Over Temperature	5	Warning Level 1	4
Low Oil Pressure	9	Warning Level 2	7
Low Oil Level	15	Power Reduction	8
Low Fuel Level	23	Maintenance Needed	24
Low System Voltage	11	Engine Communication Error	22
Low Coolant Level	12	Sub or Secondary Throttle	25
Water Flow	13	Neutral Start Protection	26
Water in Fuel	17	Engine Shutting Down	27
Charge Indicator	28	<i>Transmission</i>	
Preheat Indicator	Not used	Check Transmission	2
High Boost Pressure	14	Over Temperature	6
Rev. Limit Exceeded	18	Low Oil Pressure	10
EGR System	19	Low Oil Level	16
Throttle Position Sensor	21	Sail Drive	20

Appendix E. Supported NMEA 2000 Messages

Message	Receive	Transmit	Note
PGN 59392 ISO Acknowledgment	Yes	Yes	
PGN 59904 ISO Request	Yes	Yes	
PGN 60160 ISO Transport Protocol (DT)	Yes		
PGN 60416 ISO Transport Protocol (CM)	Yes		
PGN 60928 ISO Address Claim	Yes	Yes	See Note 1
PGN 65240 ISO Commanded Address	Yes		
PGN 65288 Raymarine SeaTalk Alarm	Yes		See Note 4
PGN 126208 NMEA Group Function	Yes	Yes	
PGN 126464 PGN List (Rx / Tx)		Yes	
PGN 126993 Heartbeat		Yes	See Note 3
PGN 126996 Product Information		Yes	
PGN 126998 Configuration Information		Yes	
PGN 127233 Man Overboard Notification (MOB)	Yes	Yes	MOB mode only
PGN 127488 Engine Parameters, Rapid	Yes		Engine mode only
PGN 127489 Engine Parameters, Dynamic	Yes		Engine mode only
PGN 127493 Transmission, Dynamic	Yes		Engine mode only
PGN 127501 Binary Status Report	Yes	Yes	DS mode only, Note 2
PGN 127502 Switch Bank Control	Yes	Yes	DS mode only
PGN 129025 Position, Rapid Update	Yes		ANCHOR mode only

Table continued

PGN 129029 GNSS Data	Yes		MOB and ANCHOR mode only
PGN 129038 AIS Class A Position Report		Yes	MOB mode only
PGN 129802 AIS Safety Related Broadcast		Yes	MOB mode only
PGN 130312 Temperature, DEPRECATED		Yes	Engine mode only
PGN 130316 Temperature, Extended Range		Yes	Engine mode only

Note 1: In MOB button mode, NMEA 2000 device class/function is 20 (Safety) / 135 (Man Overboard); in digital switching (DS), engine alarm or anchor alarm modes, NMEA 2000 device class/function is 120 (Display) / 140 (Alarm Enunciator).

Note 2: Periodic message with 2.000 ms default interval, can be changed in settings (see Section V).

Note 3: Periodic message with 60.000 ms default interval, can be changed in settings (see Section V).

Note 4: SeaTalk Alarms can be set up to be received in all modes (by default alarm IDs are not mapped, except in MOB mode alarm ID 38 «MOB» is mapped to Event 1 (see Section V).

