

Yacht Devices

User Manual

Alarm Button YDAB-01

also covers models

YDAB-01N, YDAB-01R

Firmware version

1.08

2022

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Contents

Introduction	4
Warranty and Technical Support	5
I. Specification	6
II. Device overview	8
III. Device Installation and Connection to NMEA 2000	12
IV. Configuration with External Button	15
V. Configuration with Installation Description Strings	16
VI. Control from a MFD with CZone Support	25
VII. Built-in LED Signals	26
VIII. Firmware Updates	27
Appendix A. Troubleshooting	29
Appendix B. List of Sound Signals	31
Appendix C. List of External LED Signals	33
Appendix D. Engine and Transmission warnings	35
Appendix E. NMEA 2000 Messages	36

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 button (default mode).** Press and hold the connected 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 from the Device are not transmitted externally via VHF or AIS, but are available to all NMEA 2000 devices on the vessel.
- **Digital switching alarm unit.** 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, or from the screen of a modern chart plotter. Press the connected button to cancel alarms.
- **Engines monitoring unit.** 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.

Device mode and audio signal level can be configured via connected 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 10W 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

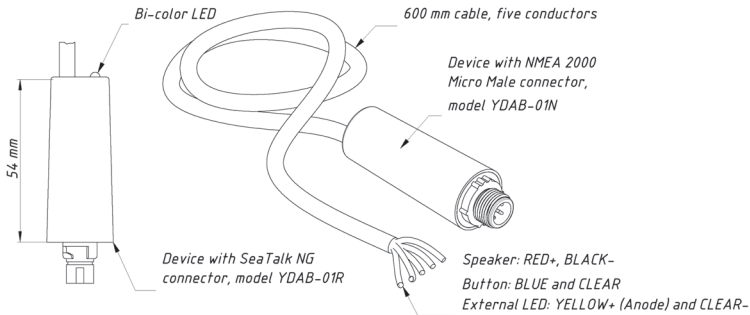


Figure 1. Drawing of YDAB-01N and YDAB-01R models of Device

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 accordance with the WEEE Directive. Do not mix electronic waste with domestic or industrial refuse.

II. Device overview

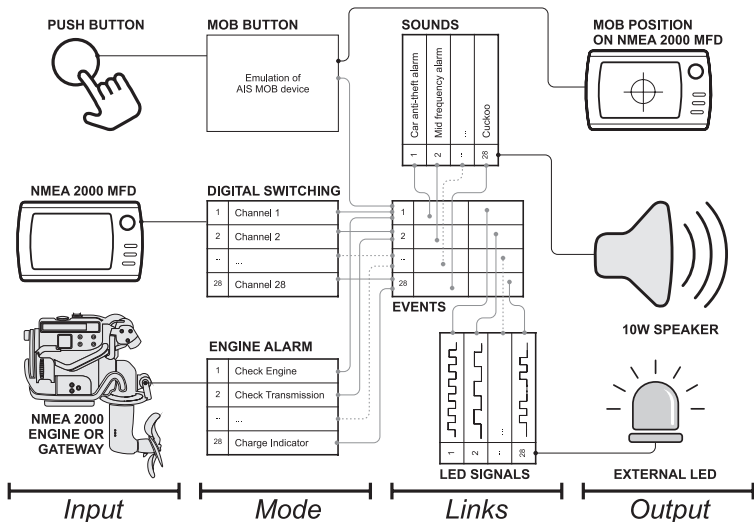


Figure 2. Functional scheme

Device can function in one of three modes: MOB button, digital switching alarm unit or engine alarm unit.

1. MOB button mode

This mode is factory default. Press connected 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 GPS 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 alert 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 the 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 alert 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.

Device can be activated not only by pressing 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, SART ACTIVE), 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 (see Section V).

You can force 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 mode

Digital switching means that you can turn some loads (digital switching channels) ON or OFF via chartplotter or software. For example, using a virtual button on the chart plotter screen you can turn on navigation lights or a bilge pump.

In digital switching 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 Wi-Fi Gateway or NMEA 2000 Wi-Fi Router allows to manage digital switching channels via web browser; it can be used to trigger an alarm remotely, say, from the cockpit, to notify the crew or scare a thief over the Internet.

Device also can receive and process proprietary Raymarine Seatalk Alarm messages (PGN 65288). Usually, such messages are sent by Raymarine chart plotters. By default, processing of SeaTalk Alarms is disabled, you can enable them using command YD:ALARM (see the Section V).

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 events from all engines, or you can link it to a particular engine by NMEA 2000 engine instance. For example, you can use two separate Devices (each one with its own dedicated speaker), one for port (instance 0) and another for starboard (instance 1) engine.

4. 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 other modes, all 28 events (with numbers from 1 to 28) are associated with 28 digital switching channels or 28 supported engine and transmission warnings.

The Device memory 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 listen to pre-recorded 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, event 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, connected button either turns channel/event 1 ON/OFF (channel/event number can be changed in settings) or if multiple channels/events were already turned ON, each button press will turn OFF an active channel/event, 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

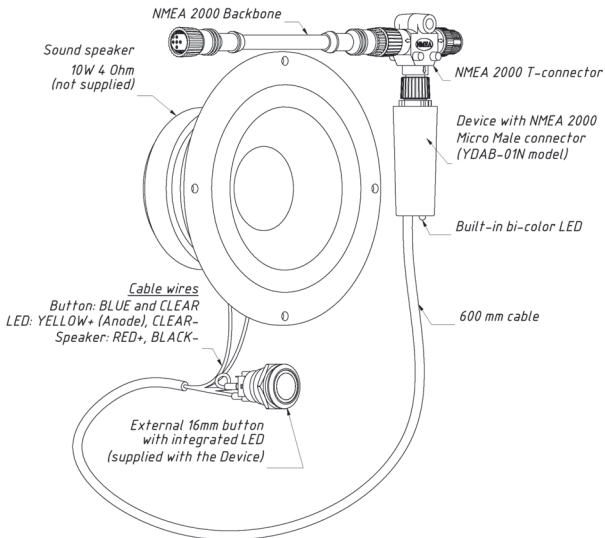


Figure 3. Device connection

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 tap from the battery near the connection point.

After connecting the Device, close connection lock to ensure 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

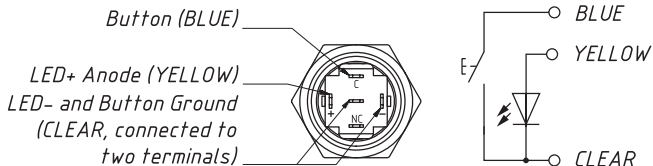


Figure 4. Button terminals and electrical scheme

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 tone 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 in the settings. (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 of 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: MOB button mode;
- 2 short flashes: digital switching mode;
- 3 short flashes: engine 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. Configuration with Installation Description Strings



Programming of the Device should not be performed at sea.

Installation description strings are usually set by installers to specify the device location or to leave notes or contact information. This can be done with professional PC software (with a hardware gateway to NMEA 2000 network) and it may be supported by some models of chart plotters. Please refer to your software or chart plotter documentation for details.

Device Properties

Address Claim

Address	67	HEX: 43
<input type="button" value="Update"/>		
Unique number	220135	
Manufacturer code	717	
Device instance	0	
System instance	0	
Class / function	120 / 140	
Industry	4: Marine	
Self-configurable	Yes	
<input type="button" value="Update"/>		

Product Information

Database version	2.100
Product code	0
Model version	Alarm Button / YACHTD.COM
Model ID	YDAB-01
Software version	1.08b 15/07/2021
Serial	00220135
Certification	Not applicable
LEN (mA)	20 [1000 mA]

Heartbeat

<input checked="" type="checkbox"/> CAN1	<input type="checkbox"/> CAN2	<input checked="" type="checkbox"/> Equipment
Updated 00:20:26.912		

Configuration Information

Installation description 1	
Installation description 2	YD:DEV 1]
Manufacturer information	Yacht Devices Ltd., www.yachtd.com
<input type="button" value="Update"/>	

Figure 5. Programming with CAN Log Viewer

To program the Device, enter a special string starting with "YD:" to installation description field 2 in the Device properties. For example, "YD:DEV 1" (without quotes) will change the NMEA 2000 Device instance to 1. If command (except "YD:RESET") is accepted by the Device, it will add "DONE" to entered text and "YD:DEV 1 DONE" will be displayed in this installation description field. If a command is entered without the parameter(s), Device replies with the current value of the parameter(s).

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

CAN Log Viewer also allows you to modify the NMEA 2000 device instance by entering a value in the dedicated field. After entering the "Device Instance" value (Figure 1, "Address Claim" settings group) click the "Update" button to apply changes and the value in the "Device Instance" field will be changed to 1, and "Installation Details 2" field will be changed to "YD:DEV 1 DONE".

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/> works 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".

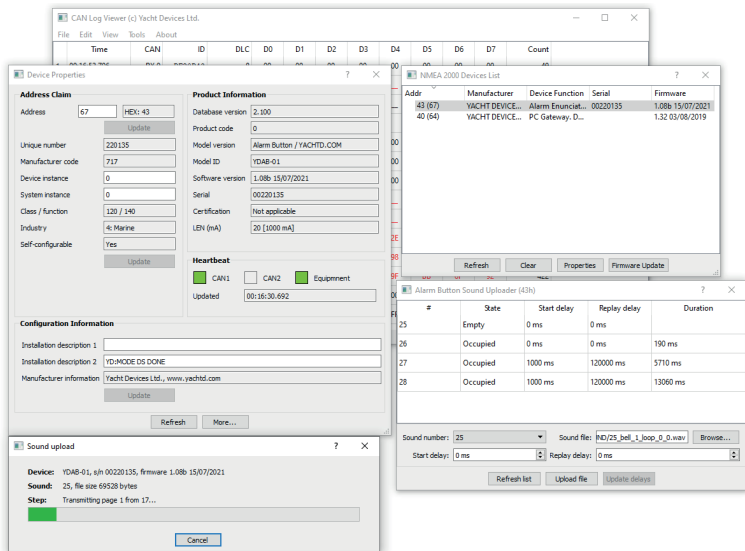


Figure 6. Audio files uploading

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

Table 1. Special strings

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]	YD:MODE MOB	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.

Table 1 continued

String format	Examples	Description
YD:STOP		Stop playback and external LED indication.
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 mode.
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.
<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.
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.

Table 1 continued

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).
<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/event will be activated when external button is pressed. If 0 or OFF value is specified, the button will only deactivate events.
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.
YD:ALARM <event number> [NONE 1..252] <RESET>	YD:ALARM 38 YD:ALARM RESET	Incoming Raymarine "SeaTalk Alarm" PGN 65288 processing rules. First parameter — event number (1–28), second — SeaTalk Alarm ID (1–252). By default all SeaTalk alarms disabled.

<i>Engine mode commands</i>		
String format	Examples	Description
YD:ENGINE [ANY 0..252]	YD:ENGINE ANY	Select engine instance to monitor. Port or single engine is identified as 0, the next has number 1. 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".
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.

String format	Examples	Description
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.

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 produces a half-second GREEN flash after powering ON, indicating that it has successfully initialized. After initialization, Device produces 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 button mode

Device flashes once in two seconds: RED – no GPS data received, GREEN – GPS position was updated in last 10 seconds.

2. Signals in digital switching mode

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

4. 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

The program must be connected to NMEA 2000 network with NMEA 2000 USB Gateway YDNU-02, NMEA 2000 Wi-Fi Router YDNR-02 or NMEA 2000 Wi-Fi Gateway YDWG-02.

You can download latest firmware version from our website:

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

Open downloaded .ZIP archive with the update and copy YDAB01.BIN file to the disk. README.TXT file inside archive can 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 Device to appear in the list.
3. Select Device and click "Firmware Update" button.
4. Locate and select update file on the disk.
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 gives off five RED half-second signals and CAN Log Viewer also informs you that update is successfully done.

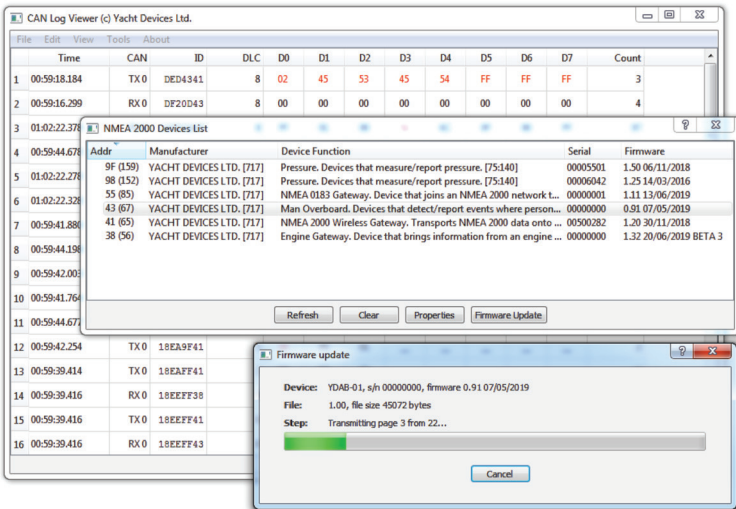


Figure 7. Firmware update of Alarm Button YDAB-01

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 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 Device connector with a spray for cleaning electrical contacts. Plug Device into another connector.</p>
Device built-in LED flashes every two seconds, but Device is not displayed in the list of external NMEA 2000 devices on the plotter	<p>1. Loose connection in the data circuit. Treat Device connector with a spray for cleaning electrical contacts. Plug Device into another connector.</p> <p>2. NMEA 2000 physical layer issue. Network segment is not connected to the plotter or there are missing terminators in the network. Plug another device into selected connector and make sure it appears in the NMEA 2000 device list on a NMEA 2000 display device (chartplotter or 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>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 setting with YD:ENGINE command (see Section V).</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. 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		MOB mode only

Table continued

PGN 129029 GNSS Data	Yes		MOB mode only
PGN 129038 AIS Class A Position Report		Yes	MOB mode only
PGN 129802 AIS Safety Related Broadcast		Yes	MOB mode only

Note 1: In MOB button mode, NMEA 2000 device class/function is 20 (Safety) / 135 (Man Overboard); in digital switching (DS) or engine 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: In MOB mode: only alarm ID 38 "MOB" can be processed, triggers evtnt 1; in DS mode: any alarm ID can be processed, mapping to events needs to be set up via YD:ALARM setting (see section V)

