



FAQ

Q - Can you please advise which of your radar reflectors are suitable for either oil rigs or buoys and what certifications they have?

A - There are no published standards for buoys or oil rigs. The two current standards ISO standards for radar reflectors were written for vessels and allow for heel of +/- 15 degrees - ISO 8729-1997 and ISO 8729-1 passive and (2) Active allow for heel up to +/-10 degrees for motor vessels or +/-20 for masted vessels and these are not applicable to buoys whose focal plain cannot exceed 5 degrees otherwise the navigation lights will not respond or at their limit.
ISO ISO 8729-1997 covers only radar reflectors for use on life boats and rescue craft and ISO 8729-1/2 has a weight restriction of 5kg or volume of 0.5M3 as a heavier unit may capsize a masted vessel. No passive radar reflector meets ISO8729-1 within the stated restrictions.

Both the EM305PE- EM305PFMS and EM325 exceed the weights and volumes as they are designed for commercial use or large vessels, buoys, oil rigs or land-sea hazards.

Our Active XS RTE meets ISO 8729-2 but since the MCA or others will not make this a mandatory fit on passenger or coded vessels there is no point in spending the quoted £18k to have the product certified to this standard and obtain a Ships Wheel Mark certification.

We have obtained QinetiQ Opinion that the Active XS meets the response requirements of ISO8729-2 which is available upon request.

Feedback on the Active XS by Ross Hobson - Pegasus (halyard/spreader mounted)

Good season following Round Ireland (where echomax was brilliant and v reassuring as we had lost of poor viz
Have a mates trip cross the the channel isalnds in July in v thick fog – at one stage could barely seen bow from stern, and we got radar “hits” on the echomax before AIS had the boat displayed – v reassuring

The echomax has been spot on all season : we have checked it against another boat with radar and they could see us clearly. I checked its position, wiring etc last weekend as it is 'hung' between spreader and it is still secure with no problems. The 'hanging' version is obviously an advantage to a race yacht like ourselves

Ross
We are surprised by some of the remarks we hear from sailors re AIS and feel that anything that helps you navigate or keep safe is a welcome bonus.

I recently met a 60 year old at METS who had sailed single handed all his life and had never managed to get much sleep. He fitted one of our XS and had just completed his third trans Atlantic crossing. He said he slept like a baby and the XS alarm woke him three times during his 13 day trip and gave him enough time to take evasive action. He said that the XS was the best piece of equipment he had ever purchased for his boat.

Contrast this to a lady sailor who phoned us many times asking questions about our XS. Eventually she said she was going to order one although only 50% of her yacht club said it was a good idea and the other 50% said they thought AIS was sufficient.

A user of the XS was so pleased with his XS and the low power consumption he rarely uses his radar.

Radar Target Enhancers - Passive radar reflectors v AIS
The function of RTE and passive radar reflectors is to return the radar signal to the transmitting radar enabling the vessel to be picked at a greater distance and seen earlier. Passive reflectors use no power and return the signal received and the Active-X – XS RTE return an amplified signal, consume a miserly 15-26mA on stand by and have multiple visual and audible alarms.

Unlike AIS the response will be restricted by land, poor weather or sea state

Radar is still the prime collision avoidance tool.

What you need to know about AIS

AIS system increases safety on board but only shows other vessels fitted with functional AIS.

Having your own AIS system fitted does not guarantee being seen or show all targets and relies upon reliable data being fed into each vessels own instruments. To trust AIS blindly can put both vessel and crew at risk and should be viewed as a supplement to other watch keeping. AIS displays can be mesmerizing and look real more real than a radar display.

AIS does not replace radar or increase the radar image of the vessel.

AIS is not fitted by Warships, some pleasure, fishing vessels, foreign flagged vessels not in IMO regs. Large weather or marker buoys. There is concern over reports that commercial AIS users may turn off their sets in crowded areas which clutter the system to a point where it becomes next to useless. Many of the older commercial ships sailing the high sea do not have their AIS integrated into the radar or chart plotters.

The AIS signals are downloaded on to a decoder on the bridge which can only be interpreted by experienced crew.

Typical Power consumption - Class A - AIS 7.3amps - Class B - 2 amps or 1.2amps receive only - add to this the draw of the screen to display the AIS data - plotter of 1.1 amps for a 6 inch screen or 3amps for a 15 inch screen

Question: Do I need to use the control box with my Active-XS?

Answer: A. You need not use the control box which serves 4 purposes. All electronics are in the radome.
1- junction box for wires - fuse
2 - houses extension alarm relay
3 - houses audible alarm loud speaker
4 - houses switches and LED

When these are used on buoys and unmanned remote vessels the control box is not used which saves 10mA of power so stand by current on XS will be reduced to 16mA. Use a 0.5a fused supply
Blue is negative/ black - brown is positive/red +
Do not use the yellow green wire tape this up. The yellow green wire senses a voltage drop when transmitting which initialises the LED

If at any time you want to check that the XS is transmitting place a meter in one of the power lines - if your meter reads 190mA then you are responding to X band or 155mA to S band or 345mA to both S and X band.

Question: We know that the radar reflector standard ISO 8729-1999 was revised in 2010 - Are any of your products compliant with the standard ISO 8729-2010? - Do you have a certificate of compliance or test results?

Answer:
In 2003 ECHOMAX obtained EU Marine equipment Directive (MED) (Wheel Mark) - SOLAS certification for the EM230/230BR - EM305PE based on ISO 8729-1997 which covered radar reflectors for vessels under ISOGT in section A.1/4.53 and A.1/1.33 radar reflectors for life boats and rescue craft.

The adoption of IMO MSC.164 (78) in May 2004 resulted in new ISO standards being generated: ISO8729-1 (passive) and ISO8729-2 (Active) later becoming effective from 23rd July 2009. In accordance with the Directive we were required to remove the Ships Wheel Mark from our rotational tooling, products, literature, website etc.

Since no commercial passive reflector within the 0.5m3 and 5kg limitations will meet ISO 8729-1 this left a void in the market for the last three years causing both confusion and uncertainty regarding which reflector can be fitted to lifeboats, rescue craft etc.

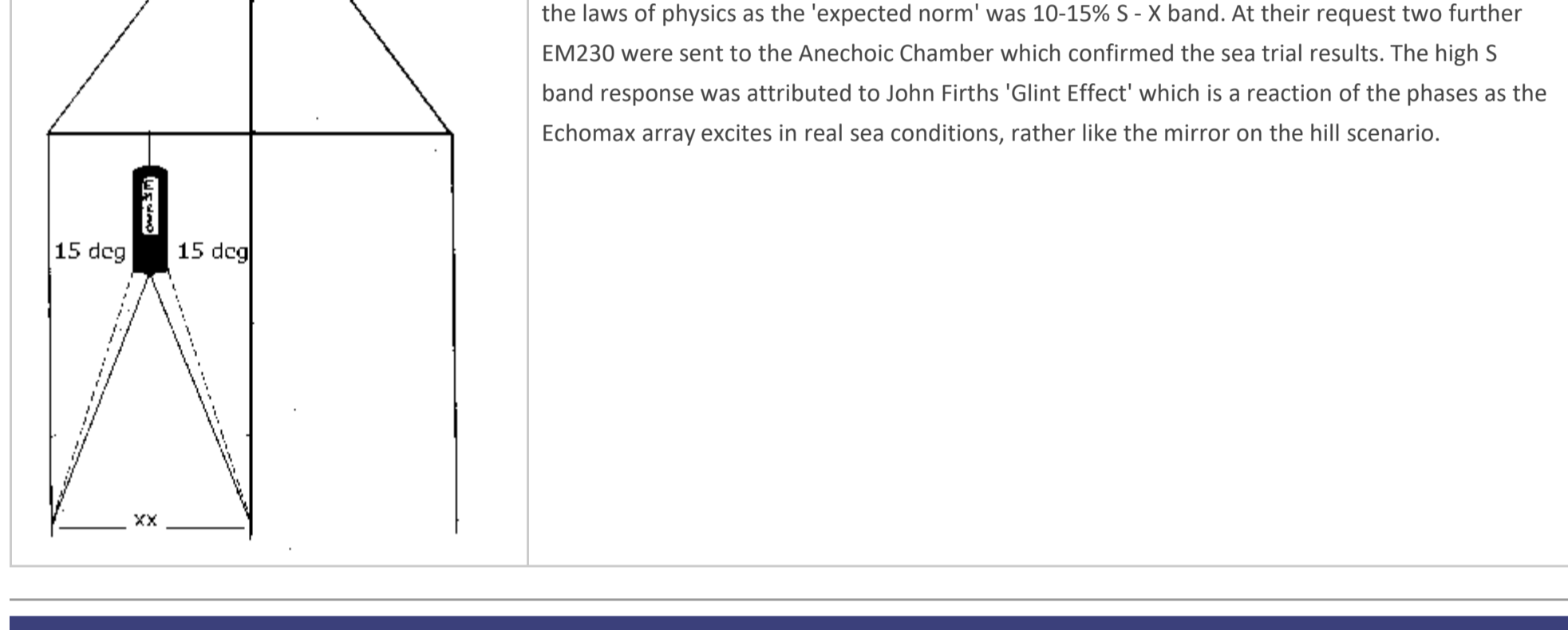
In August 2012 the EU COSS (Committee on Safe Seas and the Prevention of Pollution from Ships), the arbitrators for the MED met to debate, amongst other subjects, the lack of available product to meet the requirements for a "radar reflector for lifeboats and rescue boats" (Directive Annex A1/1.33). For practical purpose this SOLAS requirement can only be fulfilled by a Passive device, and none are available!

As a result COSS reinstated the old ISO-8729-1997 for lifeboats and rescue craft. ONLY until such time as a passive reflector becomes available which meets ISO8729-1. Since there was no size restriction on the certification there was no point in replying to recertify our EM305PE as it was too large to use in life boats and rescue craft

We have since re-gained our Ships Wheel Mark for our EM230/230BR and the BAPT -TUV Module B and D certificates and Certificate of Conformity are available for inspection if required.

Uncertainty still exists for RTE's, now in Annex A1 (A.1/4.53) as our Active-XS exceeds the ISO8729-2 and we have the option of applying for a Ships Wheel Mark at a mere £15K. However the MCA will not state what vessels, if any, must fit such a device making it impossible to invest so much without any guarantee of a return. A QinetiQ Opinion that our Active-XS meets ISO 8729-2 is available for inspection.

Mast size length x width	Centre to centre spacing	Azimuth Shadow angle	Remarks
130mm x 93mm	215mm	24.40	20' - 25' Yacht
155mm x 104mm	228mm	25.70	25' - 30' Yacht
177mm x 124mm	239mm	29.10	30' - 35' Yacht
206mm x 139mm	253mm	30.70	35' - 40' Yacht
237mm x 162mm	269mm	33.50	40' - 45' Yacht
130mm x 93mm	265mm	19.90	20' - 25' Yacht
155mm x 104mm	278mm	21.20	25' - 30' Yacht
177mm x 124mm	289mm	24.20	30' - 35' Yacht
206mm x 139mm	303mm	25.80	35' - 40' Yacht
237mm x 162mm	319mm	28.50	40' - 45' Yacht



Question: The Echomax Active X and XS band Radar Target Enhancer, just to clarify, just sits in standby mode until it detects a radar signal broadcast by another ship, at which point an alarm goes off and it then sends out an amplified signal representing your own ship? As a singlehander, it is the alarm feature which is most interests me, how loud is it? Also, I read somewhere that these devices don't operate on the same frequency as some ships' radars use nowadays, is this the case? would the dual channel RTE improve that?

Answer: The DB rating for the buzzer out of case is 85dBA at 10cm distance which figure has been used to compare the standard and waterproof cased options which would be :-

For the standard case the sound level produced is 71dBA at 10cm distance.
For the waterproof case the sound level produced is 31dBA at 10cm distance.

In case these ratings do not mean anything to the average person it is louder than a seat belt alarm in a car. The internal alarm will be audible below decks on most medium to large vessels in normal conditions and you will quickly switch it off in a radar congested water. The unique external alarm facility is also a standard feature and the integral extension alarm relay in the control box can be initialized as shown on our website or in the operators handbook which accompanies every product. When initialized the relay provides an 8A volt/power free circuit which you can then run anywhere in the vessel using either or both an audible alarm of your chosen volume or visible or flashing alarm.

When painted by an X band radar the green LED will illuminate and by a S band radar the yellow LED will illuminate. If several radars are painting the vessel then the LED may be on continuously. S band radar must be fitted by vessels of 3000GT or more and must have one or two X band radar as directed by the registering country or port.

S band radar is used on the oceans to penetrate rain, snow, rain, fog etc over 3NM. In this country X band is referred to as the collision avoidance radar and would be used up to 8 miles on average.

The RTE receives and returns an amplified image to interrogating radar.
The RTE will be actuated by the vessels own radar but will treat this as a single interrogating radar and continue to respond to all other radar. In this state you will not want to have the audible alarm switched on.

Active XRTE response to FMWC - Broadband radar.

Solid state- FMWC - broadband radar use a low transmit power which has steadily increased since their introduction 10 or more years ago. In the early days the Simrad 4G used 0.165 watts transmit power which was not enough to be picked up by the Active X - XS in normal sleep mode outside a range of 200-300m. Fortunately the power increases are now sufficient to activate the Echomax Active RTE and respond as shown below for the various listed makes.

Radar Type	Tx Power (Watts)	Antenna Gain (estimated)	Freq GHz	RTE Trigger range (nm)
Furuno DRS4D-NXT	25	24	9.4	1.5 nm
Furuno DRS6A-NXT NX10A	25	26.5	9.4	2.0 nm
Garmin Fantom 18	40	23	9.4	1.7 nm
Garmin Fantom 24	40	24	9.4	1.9 nm
Garmin Fantom 6	40	29	9.4	3.5 nm
JRC JMR-5472-S	200	28.5	3	2.9 nm
JRC JMR-5482-S	200	27	3	2.4 nm
JRC JMR-5482-SH	200	27	3	2.4 nm
Kelvin Hughes SHARPEYE™	200	28	3	2.7 nm
Raymarine Quantum	20	25	9.4	1.5 nm
Raymarine Quantum 2	20	25	9.4	1.5 nm
Simrad Halo - 4	25	27	9.4	2.2 nm
Simrad Halo - 6	25	29	9.4	2.7 nm
Simrad Halo - 3	25	26	9.4	1.9 nm
Simrad 4G	0.165	22	9.4	183.5 metres

RTE test mode
If greater detection distances are required or the need felt to respond to less powerful radar than the RTE can be placed in the test mode; however the alarm facility will be lost. The test mode is obtained by reversing the wiring to the RTE to the control box of the blue/brown cables. For the Active XS and X - yellow should be left in place. Whilst in test mode the current consumed will be increased considerably i.e.XS - 345mA instead of 26mA on stand by and X - 200mA instead of stand by 15mA

RTE v Passive radar responses

To put the RTE v Passive radar responses into perspective I give below a few response of popular passive radar reflectors in the vertical position i.e. 0 degrees - figures quoted are Stated Performance Levels

Davis Echomaster 0.37M2 - Large Trilens 3.36M2 - Standard Trilens 2.13M2 - Echomax EM230 4.70M2 ; Echomax EM305PE 10.00M2 - Echomax Active XS - X band 118.33M2 S band 15.75M2 - The EM230 and EM305PE are used by the US Navy.

Modern radars are fitted with ARPA which does not discriminate on echo strength and to avoid clutter an object will only appear on a radar screen if it sustains a hit rate of 50% or more. The high response of the Active XS will give you the best possible chance to be seen at both greater distances and especially in poor conditions.

An RTE fitted at mast top has a distant horizon of 25+/- miles so many users prefer to fit on the side rails, transom etc which reduces the horizon to 4/6 miles where decisions can be closely monitored to avoid the possibility of a collision at sea..

Hope that this covers all the issues.

Question: I'm thinking of installing an XS band RTE on my new boat. I came across an online commentary which says that the RTE should be switched off while transmitting on VHF if the RTE and the VHF antennae are close to each other. This seems like something that's hard to guarantee and possibly undesirable in an emergency situation. Can you explain to me whether this is the case, please?

Answer: There is no need to switch the VHF off when the RTE is in use.
The only reason to advise mounting on opposite sides of the mast would be to keep shadowing to an absolute minimum.
The operations manual for the Active-X/XS can be seen on the page for the Radar Target Enhancers

Fitting of the RTE at mast head gives you a horizon of +/-25 miles which may in busy shipping areas devalue use of the audible alarm as some boat owners choose to pole mount the RTE on their A frame, transom or side rails. The preferred location may be a trial or error until the best position is found. Ideally this would be 3 to 4 meters above sea level well above cabin or deck obstructions and as far from the mast as possible, to keep shadowing to an absolute minimum. This would reduce the horizon to 6-8 miles.

The only real no no is within the ships own radar transmitting band with of 23 degrees or flat against a mast.
Perhaps you could give us a link to the online commentary to put the record straight.

Question: I have AIS fitted to my 34ft vessel what are the benefits in fitting one of your Active-RTE ? Can you also explain the difference between the X and XS units you offer for sale?

Answer: AIS A (mostly commonly fitted on SOLAS vessels) or B (non SOLAS) and RTE are both safety items and both use and both use and therefore possible.
AIS Class B contains a low power VHF Transceiver and GPS and requires a VHF or GPS antenna. Some vessels do not have or fit AIS and many are mandated to do so.

All ships of 300 gross tons and upwards engaged on international voyages and cargo ships of 500 gross and upwards not engaged on international voyages and passenger ships irrespective of size shall be fitted with AIS.

The AIS system will use more power than the XS.
Your vessels identification and position may/ will show on modern vessels radar or chart plotter. On many older vessels the data will appear on a display somewhere on the bridge and needs to be interpreted.

AIS does not enlarge your vessels radar cross section on any painting radar and does not tell you that you that you are being painted.
Although never discussed Section 23 allows competent shore authorities to prevent AIS B from transmitting their data in the case of an emergency or systems overload for a finite period of time.

X band radars work at 9.3-9.5GHz and are normally 2-25kw and fitted by pleasure boats, small ferries and smaller commercial and fishing vessels. They have a range generally 2 to 30nm (dependent on mounting height of antenna and height of target and are often for collision avoidance and navigation. Most VTS and coastal surveillance radars also use this band.

You would expect an Active-X to be used for coastal and channel crossings typically Dover-Calais route.
S band radar work at 2.9-3.1GHz and are required by law on all vessels over 3000 GT. The antennas are 4 meters in length and weigh upto 180kg. They transmit 10-60KW and are usually used on the high seas to penetrate heavy rain, snow and similar precipitation. Vessels of this size must also fit one or more X band radar. Suggest you fit an XS if you are going well offshore, Atlantic, North Sea, Pacific or Channel Isles.

RTE works in conjunction with radar which is the prime long range collision avoidance tool. The RTE should enlarge most vessels RCS and make the vessel more visible on screens of interrogating radar. This is particularly important in poor visibility when the vessels normal RCS is severely attenuated and without RTE may not trigger ARPA. ARPA is fitted to most modern day radars to automatically plot radar targets and provide collision assessment information and alarms.

Active-X/XS has both visual and audible warning alarms to tell you that you are being painted and that there is a vessel with its radar in use in the area.
XS discriminates between S and X band systems. It is the vessels that carry S band being much larger that cannot stop or change course quickly.
The extension alarm facilities on both X and XS models are vital safety alerts for the single handed sailor or night watchman.

Question: I have an AIS - Receive only. How will fitting a RTE help me?

Answer: These devices are capable of receiving and displaying data from Class A and Class B systems. If, of course, the other vessel is AIS fitted and their AIS is switched on Remember, this is not always the case! You will be able to see AIS active vessels. BUT THEY WILL NOT BE ABLE TO SEE YOU

Question: Can you please tell me how I can register my new Active-XS on to my Ships License?

Answer: To add your Active-X/XS to your Ships VHF License on line you will need to be registered to use the online service and login in.
When you have logged in and see the page with your licence(s) listed, click on amend licence and work your way through until you come to the add equipment page. Expand the relevant section and add your new equipment, save the changes and then print your new licence

Question: Could you please advise how the RTE mounting height affects the response?

Answer: We do not give a mounting height in our operations manual (which is published on the website) only that the Active-X/XS must have 360 degree clear azimuth. RORC recommend a minimum mounting height of 4 meters above sea level.
Below is a table to give you an idea of how the mounting height and height of the target affects your RTE horizon. We have chosen RTE mounting heights of 2m typical RIB, 4m typical small motor boat and 8 meter typical small yacht, 12m larger yacht and a 5m and 10m target. These figures will vary according to weather conditions and sea state.

Whilst having a high mounting height gives you the advantage of a further horizon it gives you the disadvantage of a large area of response potentially with many transmitting radar which will/may continuously trigger your RTE and the audible alarm, if switched on, may become tiresome. Even if the green/yellow and audible alarm were to be on continuously the RTE would still be responding.

RTE mounting height	5m target	10m target
2mtr/ 6.5ft nearest ft	8nm	10nm
4mtr/13 ft	9nm	11nm
8mtr/ 24 ft	11nm	13nm
12mtr/39	12nm	15nm

Question:Part of email from one customer..... the unit seems to work fine but some freighters did not see a 'big' echo, only a 'normal' one.

Answer: Modern radar response may not change brilliance when the echo strengthens. A "painted" or response on a radar screen indicates that the target is above the radar's detection level. Radars fitted with ARPA (Automatic Radar Plotting Aid) do not necessarily discriminate between large and small echoes and will only automatically acquire and actively plot an object with a return or hit of 50% or more. The increased RCS response of an Active-X will be a benefit at a distance, when the vessel is bow or stern or in a mist, rain or precipitation when the vessel may not otherwise not be seen.

From what you say the unit is performing as expected as you are being seen!

You will not benefit from any RTE if the vessels Radar Cross Section (RCS) is greater the RTE. The advantages of fitting an Active-X were illustrated during the PBO Active-X v Sea Me sea trials. Using the same test vessel fitted with both SeaMe and Active-X the test radar lost the vessel with the SeaMe switched on at 5.5nm. With the Active-X switched on the same radar continued to pick up the same vessel at 6.7nm when sea trials were ceased due to too much radar traffic in the solent area.

Likewise Active-X continued to give response at greater degrees of heel. No doubt the vessel would continued to be picked up at a greater distance had the Active-X trials continued.