

...a significant advance in marine safety!

ECHOMAX

Active-X-Band

Radar Target Enhancer

OPERATION MANUAL



Echomax Active-X-Band RTE shown with optional Stainless base fitting



**Manufactured by
Echomax Products in the UK**

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ECHOMAX Active-X-Band Radar Target Enhancer

GENERAL INTRODUCTION

The Echomax Active-X Radar Target Enhancer (RTE) is designed to respond to interrogating X band radar (9.3 – 9.5GHz) by receiving a transmitted pulse and amplifying the pulse and re-transmitting the pulse back to the radar at the same frequency with minimum delay, thereby improving the radar detection range and visibility of small targets. It will not enhance significantly vessels with large radar cross section.

The RTE is primarily intended for small vessels with no radar fitted and typically should enhance the RCS (radar cross section) of vessels up to 25M in length. For small craft/rigid inflatables improvements will start to be seen at around 1-2 miles extending to 8-10 miles or more depending on prevailing conditions. The response of the RTE will vary according to range, RTE and radar height above sea level, radar power and condition. Poor weather, sea state and precipitation will greatly reduce the response

IMPORTANT

The fitting of the Echomax Active-X does not exclude you from exercising safe navigational judgement for your vessel under the International Regulations for the Prevention of Collisions at Sea and to keep a proper look out at all times

beam width of 23 degrees as this may seriously damage the PCB. The RTE should be fitted below or preferably above the radar. It is possible to shorten or extend the cable by a further 25 meters without affecting the performance using extension cable rated at 3A at 300V.

LICENSING REQUIREMENTS

Many countries and administrations require a ships radio license or modification of your existing ships radio licence before Active-X can be used for maritime use. Contact your local administration for details.

ECHOMAX ACTIVE-X COMPONENTS, CONSTRUCTION, use and installation

If you are not able to safely install the unit yourself you are advised to seek the services of a competent person or company to install the RTE.

COMPONENTS

Echomax Active-X mast head radome fitted with 24 meters of 2 core cable
Control box
Operation manual

RADOME FITTING

The antenna has provisions in the base for a 1 inch - 14 NF female thread mast fitting or deck mount bracket. Plastic mounts should not be used. To ensure a permanent fixing 'LOCTITE' or PTFE or plumbers tape should be used and the RTE must be screwed down tightly. Care must be taken to ensure that as the RTE is tightened on the base the cable is allowed to turn freely.

For mast fitting the radome must be fitted vertically as high as possible. The receive/transmit antennas positioned 70mm from the base of the radome and have a clear 360 degree azimuth. It should be fitted at least 6 inches/150mm from the mast on the offset bracket. It should not be fitted on a back stay or where its vision is obscured or is close to any metal object otherwise performance could be significantly impaired.

The radome unit must never be painted as this will seriously impair performance. The radome must not be fitted in or close to the vessels radar transmitting



ECHOMAX CONTROL BOX, use and wiring instructions

The control box must be fitted internally as it is not waterproof and can be wired from the base or back as required. A 12v fused or circuit breaker supply of 3-5A is required.

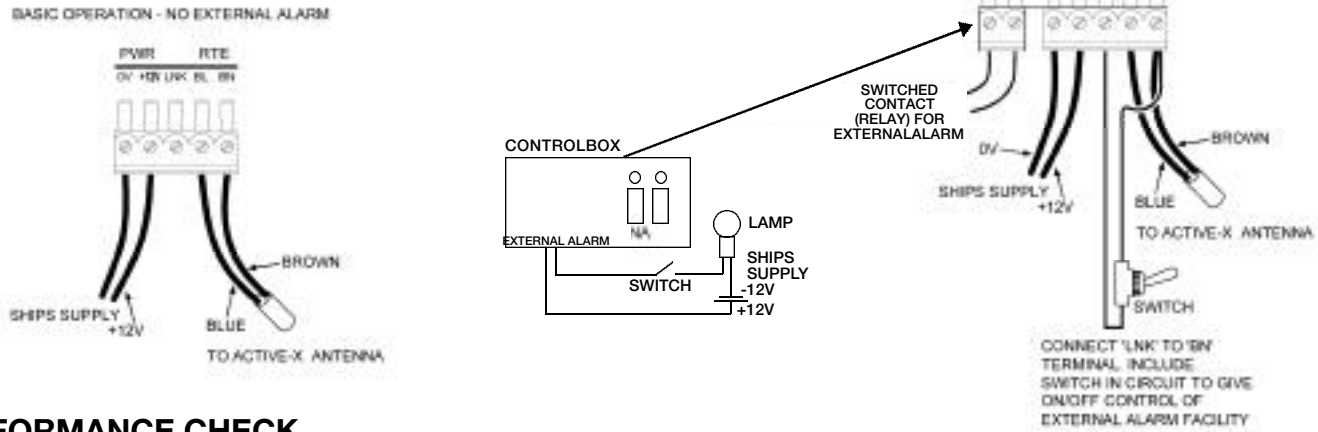
The control box has a triple alarm facility.

Once the red power switch is turned on the unit is in the quiescent mode and will consume up to 15mA. When interrogated by a radar the green LED light will flash every 2.4 seconds. If the flash lengthens then this indicates that more than one radar is painting the antenna. If painted by a high speed radar which rotates every 1.5 seconds then the LED light will flash quicker. Turning on the green switch will mobilize the internal buzzer, which is set to actuate for approximately half a second intervals. The control box also has facilities for a 8A external volt free alarm.

The control box has an externally replaceable 0.5A fuse and is surge and cross polarity protected.

RTE CONNECTIONS

The diagrams show the correct wiring installation



PERFORMANCE CHECK

As the RCS of your vessel may exceed the RCS of the RTE, the trial is best carried out at 0.5 nm as the target can be easily identified. The range should then be increased at intervals of 0.5 nm and the RTE switched on and off noting the change in response. As the range increases the bare target will not be seen and whilst moving the RTE is left on so that the test target can be seen at all times. This is important in busy waters to avoid confusion with other vessels.

If the target is lost it can be acquired by turning the RTE on and off and watching the display for change in target response. In normal weather and sea conditions, with RTE and interrogating radar mounted at four meters above sea level should respond on the radar screen as shown below. If the mounting heights, including that of the interrogating radar vary so will the response due to curvature of the earth. These figures are for guidance only and should not be relied upon.

2KW radar up to 4 nm : 5KW radar up to 10 nm : 10- 25KW radar up to 15-20 nm

FAULT FINDING CHART

No Red LED light when red switch is turned on	Check fuse or circuit breaker Check polarity of wiring Check power supply at control box Damaged cable or wrong connection
Unit switched on and continuous green LED light shows, in harbour or when saturating RTE	Local radar on, or radar operating moored nearby (<15M) Moored close to large metal object Check polarity of radome wiring Being actuated by ships own radar – turn off radar and if necessary relocate Active-X Relocate vessel to more suitable position
Unit on and buzzer on and unit fails to operate when it clearly is interrogated	Check all above faults. Is RTE in shadow of interrogating radar as it will not operate if masked
Buzzer switched on but does not sound when painted by radar	Buzzer faulty – return control box to Echomax for inspection

TECHNICAL SPECIFICATION

Operating frequency	X band (9.3-9.5GHz)
Position Accuracy	Within 1 meter
Dimensions and Weight of radome ex cable	L 478mm W 40.5mm wt 327 grms
Cable	24M 2 core 0.5mm ² wt 969grms
Base Mounting	1 inch – 14 NF female thread
Dimensions of control box	W 92mm H 51mm D 38mm
Externally accessible fuse	0.5A
Power supply	12V DC – 30% - 10% voltage surge and cross polarity protected
Stand by current consumption in quiescent state	< 15mA
	5 interrogating radar 23mA (typically)
	10 interrogating radar 32mA (typically)
EIRP	1W (typically)
Stated Performance Level (SPL)	Exceeds ISO 87292-2 X Band requirement of 7.5M ² SPL at Zero, +/-10 and 20 degrees of heel*
Compass safe distance	1 metre

*Active-X tested QinetiQ - Funtington 13th March 09
 zero degrees 111.36M²
 +/- 10 degrees of heel 78.96M²
 +/- 20 degrees of heel 20.80M²

**STAINLESS STEEL
OPTIONAL EXTRAS**

Offset mast head bracket	V9173
Base fitting for cabin roofs / A frame	V9174
150mm extension pole	RA103/15
300mm extension pole	RA103/30

GUARANTEE

The Echomax Active-X band RTE is guaranteed for 12 months from the date of purchase and provides for the complete replacement at our discretion of the complete unit or any of the components providing failure is attributed to component failure or defect which is not attributed to accidents, misuse, fair wear or tear or neglect.

The guarantee is invalidated by any attempt whatsoever to open up or interfere in any way with the unit.

It is the users responsibility to return the unit at his expense to us to inspect and report on the reason for failure. No exchange unit will be given until a full inspection and report is issued.

This guarantee does not affect your statutory consumer rights or those governed by local Law.

For comparison with competing products see www.echomax.co.uk.



*Echomax Active-X-Band RTE shown with optional
Stainless base fitting*

Declaration of Conformity

(As required by Article 6.3 of Directive 1999/5/EC-RTTE Directive)
Declares under his sole responsibility that the active radar target enhancer manufactured by:

AQUAMATE PRODUCTS LTD. also trading as
ECHOMAX
PO Box 6032
Dunmow
Essex CM6 3AS U.K.
Telephone + 00 44 (0) 1371 830216 Fax 831733

Email: echomaxsales@aol.com

Intended for Worldwide use as an X Band active radar target enhancer aboard non SOLAS vessels and identified by the type number Active-X to which this declaration refers has been tested to the essential radio, EMC & safety test suites required by the notified body and is in conformity with the standards

EN60945: 2002 (Clauses 9, 10 & 12)
And complies with the essential requirements of Directive 1999/5/EC

Conformity procedure under Annex IV of 1999/5/EC (Technical Construction File) has been undertaken by QinetiQ (0191) of Cody Technology Park, Ively Road, Farnborough GU14 0LX UK

The Technical Construction File is held by:-
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ECHOMAX
PO Box 6032
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Signed

John H. Simpson
Managing Director

September 2009



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