

call sign, name, type/cargo, dimensions, location of the onboard positioning system, type of positioning system (eg GPS), draught, destination, ETA and an optional, high-accuracy time stamp available on request.

The problems with Class A for small vessels are twofold. It's typically expensive – a transponder will set you back more than £2,000 – and a leisure vessel is unlikely to be able to provide enough data to make the most of the specification. How many small boats have a rate of turn indicator, and does it matter where the GPS is located if the boat is only 8m long to start with?

For some time the solution was to fit a receive-only unit, and this remains a good, low-cost option for small-boat AIS with prices starting from as little as £120. It provides you with all the information available from boats with transponders, enabling you to spot ships at a distance and take avoiding action accordingly. However, it provides no indication of your presence to the ship, which is where Class B AIS transponders come into their own.

Class B transponders

The first Class B AIS transponders became available in 2006, as soon as the standard had been approved. Although messages are

in a similar format to Class A, the amount of required data is reduced. Four message types can be sent: a safety-related message, predefined in the unit's software; a standard position report containing MMSI, time, SOG, COG, position and heading; an extended position report which adds the ship type and dimensions; and a static data report sent every six minutes and similar to the Class A message, comprising MMSI, name, type, call sign, dimensions and the equipment vendor ID. Position reports are sent at 30-second intervals, provided the vessel is travelling at less than 14 knots – the interval is reduced at

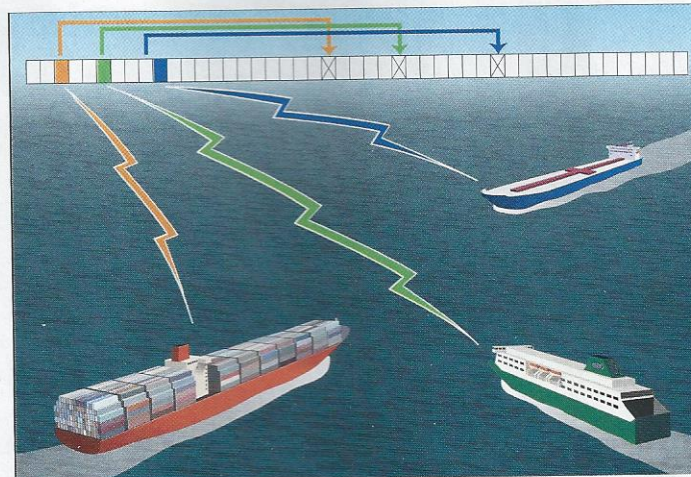
higher speeds.

The major difference, however, is inside the box. Class B uses a different, lower-priority protocol designed

to preserve the integrity of AIS Class A for shipping. This protocol, CSTDMA (Carrier-Sense Time Division Multiple Access), dispenses with the pre-booking required by SOTDMA and instead looks for an empty time slot when it is ready to transmit. If one is available, it transmits, if not, it waits. If transmissions fail consecutively, the user is notified.

Power is also limited to 2W, reducing the effective range to a maximum of around 10 miles: plenty for a smaller, slower boat

Class B AIS looks for an empty time slot when it is ready to transmit



How Class A AIS transmits and then reserves its next time slots

and reducing clutter on the system.

By these means, Class B preserves the priority Class A messages while providing good service to smaller vessels at a lower cost, with prices from around £450.

What's on the market?

Class B AIS transponders and receivers fall into two broad groups: those with displays and the other 'black boxes' without displays. Both send and receive exactly the same data – the difference is how that data is displayed.

Units with displays offer a reliability advantage in that they are not affected by the failure of other equipment, and hence find favour with many semi-professional users. Other potential

buyers are offshore sailors who like to keep track of any vessels passing nearby but don't need the plotter for deep-water navigation, or those who prefer traditional navigation but would like the safety features offered by AIS.

Black box units come in many shapes and sizes, whether it's a tiny USB dongle for your laptop, an integrated VHF/AIS set, a combined antenna and receiver or a dedicated unit, but all require a plotter or laptop to display the data they output in a user-friendly form.

Most major manufacturers produce both AIS receivers and transponders, but while a receive-only unit may well be their own work, transponders rarely are. Considerable development and testing is required, so most companies opt to buy the electronics from a third-party and rebadge them. Some exceptions are Amec, Furuno, Vesper Marine and Weatherdock.

By far the most common of these third-party manufacturers is Somerset-based SRT Marine Technology. Originally a spin-off from Securicor, the fledgling company were involved in defining the Class B standard and hence were able to bring a transponder to market almost as soon as the standard was approved, gaining an early head start. They sell both transponders and receivers, packaged or as just the circuit board, but you'll never see their brand on the unit. It can, however, be instructive to look at the packaging and especially the connector layout of your chosen product and compare it with the photos on SRT's website (srt-marine.com) – you might find some striking similarities! It can also help you to find some bargains, as prices vary between manufacturers for what is essentially the same unit.

Installing AIS

AIS units need two items: an antenna and, unless you are using a unit with a display, a means to show the data.

Conventionally, AIS units are connected to chart plotters using NMEA 0183 running at 38,400 baud. This can be problematic as NMEA 0183 normally runs much more slowly at 4,800 baud. Most chart plotters allow inputs at one speed or the other: not a problem if AIS is the only input you need, but a nuisance otherwise. Off-the-shelf solutions are available from manufacturers such as Actisense to multiplex inputs at either speed to a single, 38,400 baud stream.

Increasingly, however, AIS units are on sale with NMEA 2000 interfaces. These are compatible with most



Splitters like this Weatherdock Easy Split allow AIS to use the same aerial as your VHF

manufacturers' equipment, and solve the problem. If you're buying a new AIS unit, it's worth getting one that will work on a modern network in order to provide a clear update path for the future. Alternatives include USB and WiFi connectivity.

The aerial required is a standard marine VHF aerial, and can be installed separately or shared with the boat's VHF via a splitter. A splitter is essential to ensure that there is no way either

the AIS or VHF can transmit at full power directly to the receiver of the other device, which would destroy the electronics. This has the advantage that only a single aerial is required, but does add complexity and a certain amount of signal loss from the splitter. It also means that the VHF cannot receive while the AIS is transmitting, and vice versa, although in practice this is rarely a problem. Some AIS units include a splitter, which will be reflected in the price.