AIS Know-How: Data transfer (SOTDMA vs. CSTDMA)

Since the end of 2000, the [Automatic Identification System](#) (AIS) has become a binding standard to improve navigation and safety at sea. Position, course, speed, and other ship data are transmitted alternately on two maritime VHF channels — 161.975 MHz and 162.025 MHz.

Per minute there are 2,250 Slots available for the transmission of AIS data telegrams. Two methods are available for transmitting the AIS data telegrams:

One is the **CSTDMA (Carrier Sense Time-Division Multiple Access)** method, which is used primarily for pleasure boating (Class B). The CSTDMA method uses carrier-sensing to defer transmissions until no other stations are transmitting. If a free slot is found, the transmission starts. The transmission is stopped for a 30 second time interval before the next one starts.

The other method is the **SOTDMA (Self-Organized Time-Division Multiple Access)** technology, which was used only by commercial vessels (Class A) but is now also authorized for pleasure boating at Class B level. With the SOTDMA method only the first free slot for the transmission has to be found. The next five slots are always reserved automatically. The following hierarchy results for the transmission of AIS data telegrams:

1. Class A (commercial vessels) & SART (rescue transmitter)
2. Class B SOTDMA (pleasure boating)
3. Class B CSTDMA (pleasure boating)

Main advantages of SOTDMA vs CSTDMA for pleasure boating (Class B) at a glance:

SOTDMA (Class B) – Self-Organized Time-Division Multiple Access

- + 5 watt transmission power
- Transmission interval up to every 15 sec. (depending on speed)
- Reservation of future slots
- Sending/receiving of text messages (addressing to MMSI possible)
- 2nd priority to Class A devices

CSTDMA (Class B) — Carrier Sense Time-Division Multiple Access

- 2 watt transmission power
- Send interval every 30 sec. (fixed)
- **no** reservation of future slots
- **no** sending/receiving of text messages
- 3rd priority to Class A devices

— Source: Weatherdock AG