

# (Pt24) Research and Design of AIS Reception Signal Processing System Based on GNU Radio

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**(Pt9) Abstract**—The Automatic Identification System (AIS), as a standard communication and navigation device for ships, plays a significant role in ensuring the safety and efficiency of maritime traffic. The accuracy of the AIS receiver's signal processing directly affects the bit error rate (BER) and packet error rate (PER) of the AIS system, drawing considerable attention to AIS signal reception and processing technologies. Current research on AIS reception signals mainly focuses on custom implementations using hardware platforms like FPGAs; however, the high cost of hardware implementation has become a limiting factor in the development of AIS signal processing technologies. Therefore, this paper designs an AIS reception signal processing system based on GNU Radio, developing demodulation algorithm and NRZI decoding modules, and testing them with typical demodulation algorithms. Experimental results demonstrate the feasibility and effectiveness of the designed reception signal processing system.

**(Pt9) Keyword**—AIS reception signal processing, demodulation algorithm module, NRZI decoding module, GNU Radio, software-defined radio (SDR)



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