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(57) Abstract :
The invention discloses a device for low-latency communication in wireless sensor networks comprising a sensing module (101), communication interface (102), MAC controller (103), synchronization unit (104), routing processor (105), and power management unit (106). The device employs a hybrid MAC protocol, adaptive synchronization, and intelligent routing to minimize latency and enhance real-time communication. An adaptive retransmission buffer (107) further reduces packet delay. Experimental validation demonstrates reduced end-to-end latency, high delivery ratio, and energy efficiency, making the device highly suitable for mission-critical applications.

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