

HS Series Encoder Data Structure

The HS Series encoder is designed to securely register button presses or switch closures over a wireless link for remote control applications. It will turn eight parallel input lines into an encrypted serial bit stream output.

The encoder will send messages for as long as the SEND line is high. Each message consists of two packets separated by a 3.8mS gap. Each packet has a start sequence that consists of a wake period, noise filter, and preamble byte. The preamble byte has 10 bits, a start bit, 3-bit error check, inversion flag bit, four-bit User ID, and a stop bit. The data portion is encrypted, so will be different within each message, and from message to message.

The HS Series algorithm calculates the Hamming weight of the encrypted data portion of each packet before it is sent. If it is greater than 50%, then the packet is logically inverted. This guarantees that the duty cycle of the encrypted data will never be greater than 50%. The preamble is designed to be less than 50% worst-case, so adding these together gives a worst-case message duty cycle of just under 50%.

Processing Time			Wake	Noise Filter	Error Check	User ID	Encrypted Data	Processing Time	Wake	Noise Filter	Error Check	User ID	Encrypted Data
3.3mS	3.4mS	3.8mS	1010	1400uS	0 1100 or 0 1101	XXXX 1	80 bits	3.8mS	1010	1400uS	0 1100 or 0 1101	XXXX 1	80 bits

Total Message Time at 4,800bps = 57.1mS
Worst Case Duty Cycle at 4,800bps = 48.6%
Total Message Time at 28,800bps = 25.5mS
Worst Case Duty Cycle at 28,800bps = 43%

