

word, known as JK, is encoded, it appears as 11000 10001, and the most significant bits are at the left-hand end of the 5-bit replacement symbols. In 100Base-X Ethernet applications, the unique JK control word is known as the start-of-stream delimiter that defines the beginning of data transmission sequences and code group boundaries.

The 4B5B decoder at the receiving end of the communications link should receive only the 16 valid replacement symbols shown in the left-hand half of Table 3–1 when data is being transported by the communications link. The receiver can also decode valid idle symbols sent when no parallel data is available to be transported across the serial communication channel.

Table 3–1 4B5B Encoding Rule

4B5B Data Encoding Rules			4B5B Control Encoding Rules		
MII Data Nibble	5-Bit Replacement Symbol	Interpretation Hex Data	MII Data Nibble	5-Bit Replacement Symbol	Interpretation Control Function
0000	11110	0	Undefined	11111	Idle
0001	01001	1	0101	11000	J
0010	10100	2	0101	10001	K
0011	10101	3	Undefined	01101	T
0100	01010	4	Undefined	00111	R
0101	01011	5	Invalid Symbols		
0110	01110	6	Undefined	00100	Transmit Error
0111	01111	7	Undefined	00000	Error
1000	10010	8	Undefined	00001	Error
1001	10011	9	Undefined	00010	Error
1010	10110	A	Undefined	00011	Error
1011	10111	B	Undefined	00101	Error
1100	11010	C	Undefined	00110	Error
1101	11011	D	Undefined	01000	Error
1110	11100	E	Undefined	01100	Error
1111	11101	F	Undefined	10000	Error
			Undefined	11001	Error

Notes:

- 1) JK start delimiter symbols are always used in pairs.
- 2) RT end-of-stream symbols are always sent in pairs.
- 3) The 00100 symbol is used to force signaling errors.

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