Set the baud rate and the error introduced

For standard crystal and resonator frequencies, the actual baud rate of communication in the asynchronous mode may be calculated by obtaining the baud rate, the error between it and the communication baud rate used to calculate the following formula can be used:

$$\text{Error [\%]} = (\text{Baud}_{real} / \text{Baud} - 1) * 100\%$$

among them, Baud A commonly used communication baud rate, Baud $_{real}$ Is calculated by the formula baud rate, the baud rate into the calculation formula can be obtained with the system clock baud rate error f $_{sys}$ And baud rate register UBRR The relationship between the values are as follows: Normal mode:

$$\text{Error [\%]} = (f_{sys /(} 16 * (UBRR + 1)) / \text{Baud} - 1) * 100\%$$

Speed mode:

$$\text{Error [\%]} = (f_{sys /(} 8 * (UBRR + 1)) / \text{Baud} - 1) * 100\%$$

When the clock error regardless of traffic on both sides, i.e., the system clock f $_{sys}$ When a standard clock, baud rate error can be obtained UBRR

The relationship between values. The following table shall be 16MHz Under different system clock UBRR Setting the baud rate error value.

16MHz The system clock is set at UBRR Error generated

Baud Rate (Bps)	f_{sys} = 16.000MHz			
	Normal mode (U2X = 0)		Speed mode (U2X = 1)	
	UBRR	error	UBRR	error
240048009600	416	-0.1%	832	0.0%
	207	0.2%	416	-0.1%
	1,036,851,342,516,1280,83%		207	0.2%
14.4K	0	0.6%	1,381,036,834,512,5160,873.	
19.2K		0.2%	1	0.2%
28.8K		-0.8%		0.6%
38.4K		2.1%		-0.8%
57.6K		0.2%		0.2%
76.8K		0.2%		0.2%
115.2K		-3.5%		2.1%
230.4K		8.5%		-3.5%
250K		0%		0%
0.5M		0%		0%
1M		0%		0%

Multiprocessor Communication Mode

Position UCSRA Multi-processor communication mode (MPCM) Bits can USART The receiver receives the data frame filtering. Those frames no address information will be ignored and will not be stored in the receive buffer. In a multiprocessor system, the processors communicate via the same serial bus, which effectively reduces the need for CPU Number of processed data frames.

MPCM Set bit does not affect the transmitter, but a multi-processor communication system, a method of its use will vary.

If the receiver the received data frame length 5 To 8 Position, then the first stop bit is used to indicate the current frame contains data or address information. If the data received by the receiver is the frame length 9 Bits, then by the first 9 Position to determine whether data or address information. If the frame type for the flag "1" , Then this is the address of the frame is a data frame.