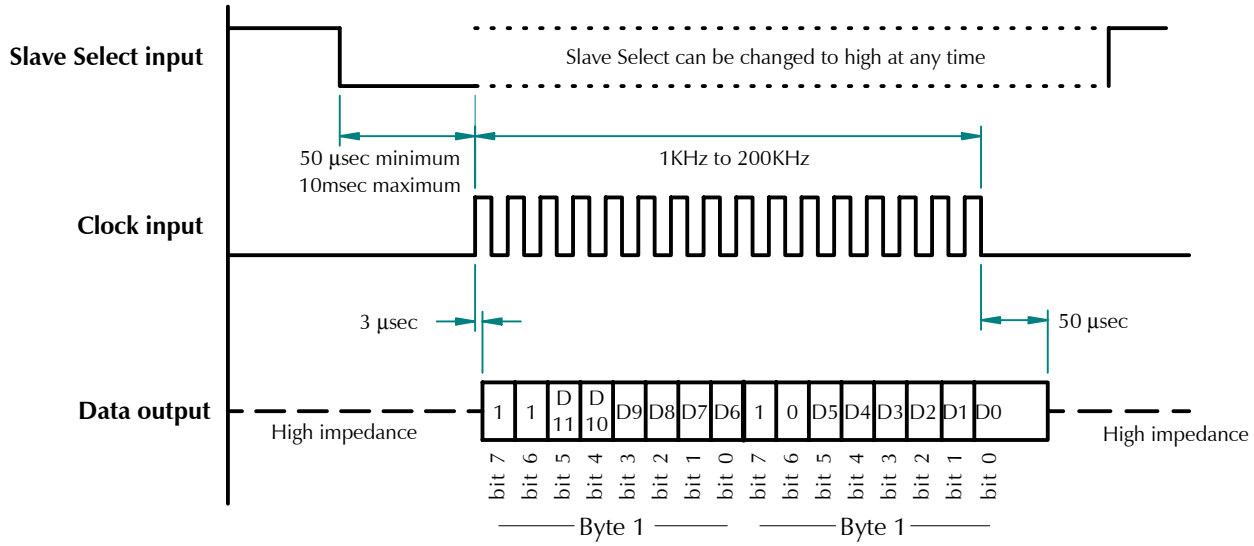
The SR12 with serial peripheral interface is used to output absolute position data in serial format using only three wires: a Slave Select input, Clock input, and Data output. The SR12 functions as a slave device and requires a master device to supply the Slave Select and Clock inputs.

While power is applied, the SR12 is continuously reading and storing its position. Position information is updated at least 2 times per millisecond when not transmitting. In this state, the master device has the Slave Select high, Clock low, and the SR12 has the Data output in a high impedance state.

To retrieve position data from the SR12 the master lowers the Slave Select input and then waits 50 µsec minimum. This interrupts the normal processing of the SR12. The SR12 enables the Data output and prepares to transmit the most recent position data. During the time the SR12 is transmitting data it is not updating its position. After the master waits at least 50 µsec, it generates the Clock input at any rate between 1KHz and 200KHz. For each clock pulse the SR12 outputs 1 bit of data for a total of 16 bits. Data is available on the output 3 µsec after each rising clock edge. After the falling edge of the 16th clock pulse, the SR12 holds the 16th bit on the Data output line for 50 µsec and then puts the Data output in a high impedance state. The master can return the Slave Select to high at anytime after the initial 50 µsec wait period, and it must be returned to a high state before initiating another data transfer. The master must wait the full 50 µsec after the last data bit before initiating another data transfer, however it should wait at least another 1/2 millisecond so the SR12 can update the position information.



Notes:
1. D11 is always the most significant bit of position data.
2. For an 10-bit SR12 (SR12-1024...) D1 and D0 are zero. For a 9-bit SR12 (SR12-512) D2, D1, and D0 are zero. For 8-bit SR12 (SR12-256...) D3, D2, D1, and D0 are zero.
3. To indicate an error condition, all bits are set to zero.
4. Nomimal voltage levels: High - 5vdc; Low - 0vdc
5. Clock pulses beyond the 16th are ignored.
6. Clock pulses should not be generated during the 10 µsec wait period after Slave Select is set low.