REPRESENTATIONS OF INTEGERS

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**Introduction**

When working with any kind of digital electronics in which numbers are being represented, it is important to understand the different ways of numbers representation systems. Numbers are represented by two voltage levels which can represent a one or a zero (an interesting exception to this rule is the new memory device recently announced by Intel which uses one of four possible voltage levels, thereby increasing the amount of information that can be stored in a given space). The number system based on ones and zeroes is called the *bi*nary system. Before discussing the binary system, a review of the *dec*imal system is in order, because many of the concepts of the binary system will be easier to understand when introduced alongside their decimal counterpart.

Wel have some familiarity with the decimal system. For instance, to represent the positive integer one hundred and thirty five as a decimal number, we can write. The subscript 10 denotes the number as a base 10.

The rightmost digit is multiplied by 100, the next digit to the left is multiplied by 101, and so on. Each digit to the left has a multiplier that is 10 times the previous digit.