There have been significant gains in the energy efficiency of hydronic heating systems in the last decade. Many of these gains have been made possible by the use of microprocessors to better control the boiler's function. Modulation is one of the functions that modern boiler controls have made possible that is driving energy efficiency gains.

Modulation is the term used to describe the ability of a boiler to fire at varying rates. If you think of a gas stove, modulation is your ability to control the burner's heat output - anywhere from "warm" to "full boil".

Traditional boilers do not have the ability to modulate. They are either at "full boil" or they are off. Now, think how efficient it would be to cook your dinner with this type of control. You would be constantly turning the stove on and off, trying to maintain the right temperature. If you consider that boilers are inefficient during the start-up periods and are actually least efficient at "full boil" otherwise known as "high-fire", you will quickly realize that this is not the best way to run a boiler.

Modern controls such as those in Prestige boilers, use a variety of sensors to monitor the boiler system and adjust (modulate) the output of the boiler to meet the heating needs of the home. This modulation allows the boiler to run longer (fewer on and off cycles) at lower fire rates (for improved efficiency) while still maintaining the desired temperature in the home. Modulation is effective in residential radiant heating applications. This is especially true in modern radiant floor heating, where the system temperatures are lower.