How do I make up a resistor?

Almost all alarm systems use end of line resistors. Many use multiple resistors to give alarm and tamper, or multiple zones on the one physical input to the panel. One of the more common calls I get is in relation to 'not having the right resistor'.

With some panels, like Genesis, this is not an issue as the system supports 16 field programmable EOL (end of line) resistor combinations. In most panels you must use the specified resistors. Please remember that most panels will accept a minimum of 10% tolerance on the resistance, many will accept up to 20%.

Resistor values are measured in OHMS, which is written as Ù. Resistors are commonly referred to using the 'K' nomenclature. The K is an abbreviation for **K**ilo, which of course means 1000. Therefore a resistor which is referred to as a 1K resistor means it is 1000Ù. Where a resistor is not an exact multiple of 1000Ùs then the K is used in place of the decimal point ie 2200Ù= 2K2 in place of 2.2K. This is to ensure that the decimal is not missed (or incorrectly inserted) on faxed or copied documents.

It is quite easy to make up resistor values. **There are 2 simple**

rules to remember...

If the resistors are in series then the values are added eg $\mathbf{R_t=R_1+R_2}$**,** where $\mathbf{R_t}$ is the total of the resistance. If more than 2 resistors are used just keep adding them ie $\mathbf{R_t=R_1+R_2+R_3+R_4}$ etc. If we needed a 4K7 resistor and only had 2K2s with us we could put 2 together in series and get 4K4, which would probably be close enough.

If the resistors are in parallel it is a little more complicated. The formula is

$\mathbf{1/R_t = 1/R_1 + 1/R_2}$. Therefore, if we require a 1K resistor we can 'manufacture' it out of two 2K2 resistors.

1÷2K2 + 1÷2K2 = 1÷1K1≈909Ù which gives us *about* a 1K resistor as required.

If we require a 2K2 resistor we can make it out of two 4K7s or three 6K8s. 1÷6K8 + 1÷6K8 + 1÷6K8 ≈ 2K3 which is almost exactly 2K2.

If we needed a 3K3 resistor we could use a 10K and a 4K7 in parallel ie 1÷4K7 + 1÷10K ≈ 3K2 which is very close to 3K3.

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