Metric Prefixes

Power of Ten	Prefix	Symbol	Value	Structure
10^{15}	Peta	**P**	1,000,000,000,000,000 **one quadrillion**	1 plus 15 zeroes
10^{12}	Tera	**T**	1,000,000,000,000 **one trillion**	1 plus 12 zeroes
10^{9}	Giga	**G**	1,000,000,000 **one billion**	1 plus 9 zeroes
10^{6}	Mega	**M**	1,000,000 **one million**	1 plus 6 zeroes
10^{3}	kilo	**k**	1,000 **one thousand**	1 plus 3 zeroes
10^{0}	Unit		1 **one**	1 plus NO zeroes
10^{-3}	milli	**m**	.001 **one thousandth**	3 places right of decimal
10^{-6}	micro	**μ**	.000001 **one millionth**	6 places right of decimal
10^{-9}	nano	**n**	.000000001 **one billionth**	9 places right of decimal
10^{-12}	pico	**p**	.000000000001 **one trillionth**	12 places right of decimal

Binary Measurement Terms

Term	Symbol	Value
bit	**b**	**b**inary dig**it**
byte	**B**	8 bits

Electrical Measurement Terms

Term	Symbol	Used to Express
amps	**A**	current
hertz	**Hz**	frequency (cycles per second)
ohms	**Ω**	resistance
volts	**V**	voltage
watts	**W**	power

Converting Units Within the Metric System

Using a Multiplication Factor

Units can be converted by using a multiplication factor. Use of a multiplication factor results in simply moving the decimal point left or right. Use the table below to convert units.

When Moving Left to Right Use Positive Power of Ten

10^{12}	10^{9}	10^{6}	10^{3}	10^{0}		10^{-3}	10^{-6}	10^{-9}	10^{-12}
tera	giga	mega	kilo			milli	micro	nano	pico
T	G	M	k		•	m	μ	n	p

When Moving Right to Left Use Negative Power of Ten

Example:

Convert 50 mA to A.

In this example, mA is the multiplication factor. Because the basic unit (A) is three places to the left of mA, move the decimal point three places to the left.

3 2 1

.050. mA = 0.050 A

Using Powers of Ten

Converting units from one prefix to another can also be accomplished by multiplying by a power-of-ten notation. It produces the same result as moving decimal points. When moving from left to right in the above table, multiply by a negative power-of-ten. When moving from right to left in the above table, multiply by a positive power-of-ten.

Example:

Convert 50 mA to A **Solution**: Multiply 50 by 10^{-3}

$50 \times 10^{-3} = 0.050$ A

Convert 15,000 V to mV **Solution:** Multiply 15,000 by 10^{3}

$15{,}000 \times 10^{3} = 15{,}000{,}000$ mV

Convert 10,000,000 bytes to Mb **Solution:** Multiply 10,000,000 by 10^{-6}

$10{,}000{,}000 \times 10^{-6} = 10$ Mb