

Master Theory of RaceCore24 Brake Mod Effect

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Many people who dismiss that the RaceCore24 Brake Mod work, mostly dismiss the idea of 23-bit resolution of the loadcell. They say that 12-bit is more than enough; because a human being cannot differentiate more levels of force with their feet. However, I would like to set this in another perspective that might shed some light onto what is happening.

Any game that receives HID reports for input must support the many different HID devices that are out there. Different devices can have different bit depth and so they have different HID reports to send. HID reports can have up to 32-bit resolution of value.

Any game should therefore support the largest possible values internally. That is brake value in-game should be 32-bit. Any HID reports with braking values of 12-bit etc. must be mapped onto this 32-bit variable.

If we map 12-bit onto a 32-bit value we get $\frac{2^{32}}{2^{12}} = 2^{20} = 1048576$. That is 4096 blocks of 1048576 brake values in size. So a 1:1048576 ratio.

If we now map 23-bit onto a 32-bit value we get $\frac{2^{32}}{2^{23}} = 2^9 = 512$. That is 8388608 blocks of about 512 brake values in size. So a 1:512 ratio.

If we now map 31-bit onto a 32-bit value we get $\frac{2^{32}}{2^{31}} = 2^1 = 2$. That is 2147483648 blocks of about 2 brake values in size. So a 1:2 ratio.

Now it's easy to see why brake locking occurs with a 12-bit brake and very little to no brake locking with 23-bit or higher. As you can see, our working 31-bit brake mod is the almost ultimate brake mod for current generation of HID reports.