$N^{\otimes} = 50\,p.p.r.$ number of physical teeth on wheel sensor

$N^{\ominus} = \frac{N^{\otimes}}{5} = 10\,v.p.r.$ number of virtual teeth on wheel sensor

$N^{\bullet} = 10$ number of odo cycles in a smoothing window

$\tau^{\star} = 1\,\mu s$ clock tick

$\tau^{\circ} = 50\,ms$ odo cycle

$\tau^{\bullet} = N^{\bullet}\tau^{\circ} = 10 \cdot \tau^{\circ} = 500\,ms$ averaging window size

$$\frac{\Delta^{\circ}_{n} x}{\tau^{\circ}} \approx \left(\frac{\mathrm{d}x}{\mathrm{d}t}\right)_{t=t_n}$$

$$\frac{\Delta^{\bullet}_{n} x}{\tau^{\bullet}} \approx \left\langle\frac{\mathrm{d}x}{\mathrm{d}t}\right\rangle_{t=t_n-\tau^{\bullet}/2}$$

$\Delta^{\circ}_{n} x$ increment of quantity x during interval τ° of odo cycle n

$\Delta^{\circ}_{n}\theta = \theta_{n^{\circ}}$ increment of (wheel) angle during one odo cycle n of size τ°

$\Delta^{\circ}_{n} N^{\otimes} = N^{\otimes}_{n^{\circ}}$ increment of physical teeth during interval τ° on odo cycle n

$\Delta^{\circ}_{n} N^{\ominus} = N^{\ominus}_{n^{\circ}}$ increment of virtual teeth on odo cycle n of size τ° (n. of samples collected)

$\Delta^{\circ}_{n}\theta = \left(\frac{2\pi}{N^{\ominus}}\right)\Delta^{\circ}_{n} N^{\ominus} = 0.2\pi\Delta^{\circ}_{n} N^{\ominus} = \left(\frac{2\pi}{N^{\otimes}}\right)\Delta^{\circ}_{n} N^{\otimes}$

$N^{\ominus}_{n^{\circ}} \sim N^{\ominus}_{n}$ number of virtual teeth counted in odo cycle n

$N^{\otimes}_{n^{\circ}} \sim N^{\otimes}_{n}$ number of physical teeth counted in odo cycle n

$\delta^{\otimes}_{k}\theta = \theta_{,k^{\otimes}}$ increment of (wheel) angle from tooth k-1 to tooth k (fixed quantity)

$\delta^{\ominus}_{k}\theta = \theta_{,k^{\ominus}}$ increment of (wheel) angle from virtual tooth k-1 to tooth k (fixed quantity)

$\delta^{\ominus}_{k}\theta = \left(\frac{2\pi}{N^{\ominus}}\right)\cdot\delta^{\ominus}_{k} N^{\ominus} = \left(\frac{2\pi}{N^{\ominus}}\right)\cdot 1 = 0.314 = 0.2\pi\,\mathrm{rad}$ (constant)

$\delta^{\otimes}_{k}\lambda^{\star}_{n^{\circ}} = \lambda^{\star}_{n^{\circ},k^{\otimes}} \sim \lambda^{\star}_{n,k^{\otimes}}$ clock sample in cycle n from physical tooth $k-1$ to tooth k

$\delta^{\ominus}_{k}\lambda^{\star}_{n^{\circ}} = \lambda^{\star}_{n^{\circ},k^{\ominus}} \sim \lambda^{\star}_{n,k^{\ominus}}$ clock sample in cycle n from virtual tooth $k-1$ to tooth k

$\Delta^{\bullet} N^{\ominus} = \sum_{j=0}^{N^{\bullet}-1}\Delta^{\circ}_{n-j} N^{\ominus}$ Number of samples (teeth) over $N^{\bullet}$ odo cycles (500 ms)

$$\left[\Delta^{\bullet} N^{\ominus}\right]_{W} = N^{\ominus}\left\lfloor\frac{\sum_{j=0}^{N^{\bullet}-1}\Delta^{\circ}_{n-j} N^{\ominus}}{N^{\ominus}}\right\rfloor$$

Number of samples (teeth) over $N^{\bullet}$ odo cycles (500 ms) and completing a number of full wheel turns

$$\langle v\rangle^{\bullet}_{n} = \frac{1}{N^{\bullet}}\sum_{j=0}^{N^{\bullet}-1} v_{n-j}$$

moving average over $N^{\bullet}$ cycles trailing and including current cycle n.

$\widetilde{v}^{\bullet}_{n}$ speed smoothed over a window $\tau^{\bullet}$ trailing odo cycle n

$T_{\kappa}(v) = \delta^{\ominus}_{\kappa}\lambda\tau^{\star}$ Time interval between tooth $k-1$ and tooth k

$$\frac{\delta^{\otimes} x}{\delta^{\otimes}_{k}\lambda\tau^{\star}} \approx \left(\frac{\mathrm{d}x}{\mathrm{d}t}\right)_{\mathrm{tooth}k}$$

$$\frac{\delta^{\ominus} x}{\delta^{\ominus}_{k}\lambda\tau^{\star}} \approx \left(\frac{\mathrm{d}x}{\mathrm{d}t}\right)_{\mathrm{vtooth}k}$$

$$\Delta^{\circ}_{n} x$$

increment of x
over sampling interval n
of fixed size τ°

$$\delta^{\otimes}_{k} x$$

increment of x
over interval between detection of tooth $k-1$ and k
of variable size $\lambda^{\star}_{k}\cdot\tau^{\star}$ where λ_k is the count of clock
pulses between the two physical teeth detections