# Autoclass & dealing with 2-pair / 4-pair v100

## 145.2.7 PSE classification of PDs and mutual identification

***Change 145.2.7 as follows:***

If the PD connected to the PSE performs Autoclass (see 145.2.7.2 and 145.3.6.2), the PSE may set the minimum supported output power based on pautoclass , the power drawn during the Autoclass measurement window. pautoclass shall be increased by at least $P_{ac\_margin}$,as defined in Table 145–15, in order to account for potential increase in link section resistance due to temperature increase, up to the value defined in Table 145–11 of the Class assigned to the PD, and with a minimum power allocation of Class 1.

A PSE that measured $P_{Autoclass\_PD}$ while providing power over 4 pairs, shall increase the power allocation by at least $P_{ac\_extra}$, as defined in Equation (145–3a), during any time it provides power over 2 pairs thereafter.

***Insert new Equation as follows:***

$$P_{ac\_extra} = \left\{ \left( \frac{P_{Autoclass}}{V_{Port\_PSE\text{-}2P}\ \min} \right)^2 \times \frac{R_{Ch}}{2} \right\}_W$$

1. In 4-pairs the allocated power will be pautoclass+Pac_margin.
2. When powering 2-pairs it is for class 1-4 only. The worst case is class 4 so we will calculate Pac_extra for only class 4.
3. in 2-pairs It means that the power allocation will be pautoclass +0.5*Rch*0.5(pautoclass/Vpse_min)^2.

Pac_extra includes the effect of the cable inside Pauctocalss and now you add additional cable resistance effect. It is not clear why this is correct.
The Pac_margin for class 4 and below should be based on 2-pair as I did in darshan_01_0118 so there is no need to acount for 2-pair again.

## 145.2.7.2 Autoclass (optional)

***Split second paragraph of 145.2.7.2 into multiple paragraphs as appropriate and change as follows:***

...$P_{ac\_margin}$, defined in Table 145–15, is the mini- mum amount of power the PSE adds to P Autoclass in order to allocate enough power to cope with increases in the link section resistance due to temperature increase. $P_{ac\_extra}$ is the minimum amount of of additional power allocation (above $P_{Autoclass}$ and $P_{ac\_margin}$) that a PSE allocates while providing power in 2-pair mode, when it performed the measurement of $P_{Autoclass\_PD}$ in 4-pair mode. This extra allocation covers the additional losses incurred by the increase in link section resistance in 2-pair mode. $P_{ac\_extra}$ does not apply for PSEs that performed the $P_{Autoclass}$ measurement in 2-pair mode.