We show that antiferromagnetism in lightly Sn-doped CeIn$_3$ terminates at a critical field $\mu_0 H_c = 38 \pm 1$ T. Electrical transport, specific heat and magnetization measurements reveal that $m^*$ does not diverge, suggesting that cubic CeIn$_3$ is representative of a critical spin-density wave (SDW) scenario, unlike the local quantum critical points observed in lower-symmetry systems such as CeCu$_{6-x}$Au$_x$ and YbRh$_2$Si$_{2-x}$Ge$_x$. The existence of a maximum in $m^*st$ at a lower field $\mu_0 H_x = 30 \pm 1$ T may be interpreted as a field-induced crossover from local moment to SDW behavior as the magnitude of the antiferromagnetic order parameter falls below the Fermi bandwidth.