For a mixture of alkali-earth atomic gas in the long-lived excited state $^3P_0$ and ground state $^1S_0$, in addition to nuclear spin, another "orbital" index is introduced to distinguish these two internal states. In this letter we propose a mechanism to induce Feshbach resonance between two atoms with different orbital and nuclear spin quantum numbers. Two essential ingredients are inter-orbital spin-exchanging scattering and orbital dependence of the Landé g-factors. Here the orbital degrees of freedom plays similar role as electron spin degree of freedom in magnetic Feshbach resonance in alkali-metal atoms. This resonance is particularly accessible for $^{173}$Yb system. The BCS-BEC crossover in this system requires two fermion pairing order parameters, and displays significant difference comparing to that in alkali-metal system.