Sympathetic nervous system: Alpha-2 receptor intracellular signalling pathway

These are $G_i$ protein coupled receptors

Noradrenaline

Active $G(i)$-protein deactivates adenylyl cyclase;

Alpha-2 preceptors DEACTIVATE adenylyl cyclase. Active adenylyl cyclase activates cyclic aMP, which is a widespread second messenger. Thus, the effect of alpha-2 activation is a decrease in cAMP

Active adenylyl cyclase

Noradrenaline

There is a greater pharmacological relevance for the alpha-2 receptor: in the CNS, presynaptic alpha-2 receptors inhibit the release of noradrenaline. This means alpha-2 agonists which penetrate the central nervous system act as sympathetic antagonists. Three examples of this are clonidine, methyldopa and dexmedetomidine.

Adenylyl cyclase

Alpha 2 activation = A decrease in cAMP
Thus, no Protein Kinase A
Thus, no phosphorylated Phosphorylase Kinase.

From Peck and Hill "Pharmacology for Anaesthesia and Intensive care" as well as the mighty "Handbook of Pharmacology and Physiology in Anaesthetic Practice" by Stoelting and Hillier. Overall, I found myself referring to Goodman and Gilman most, even though it’s the least readable.