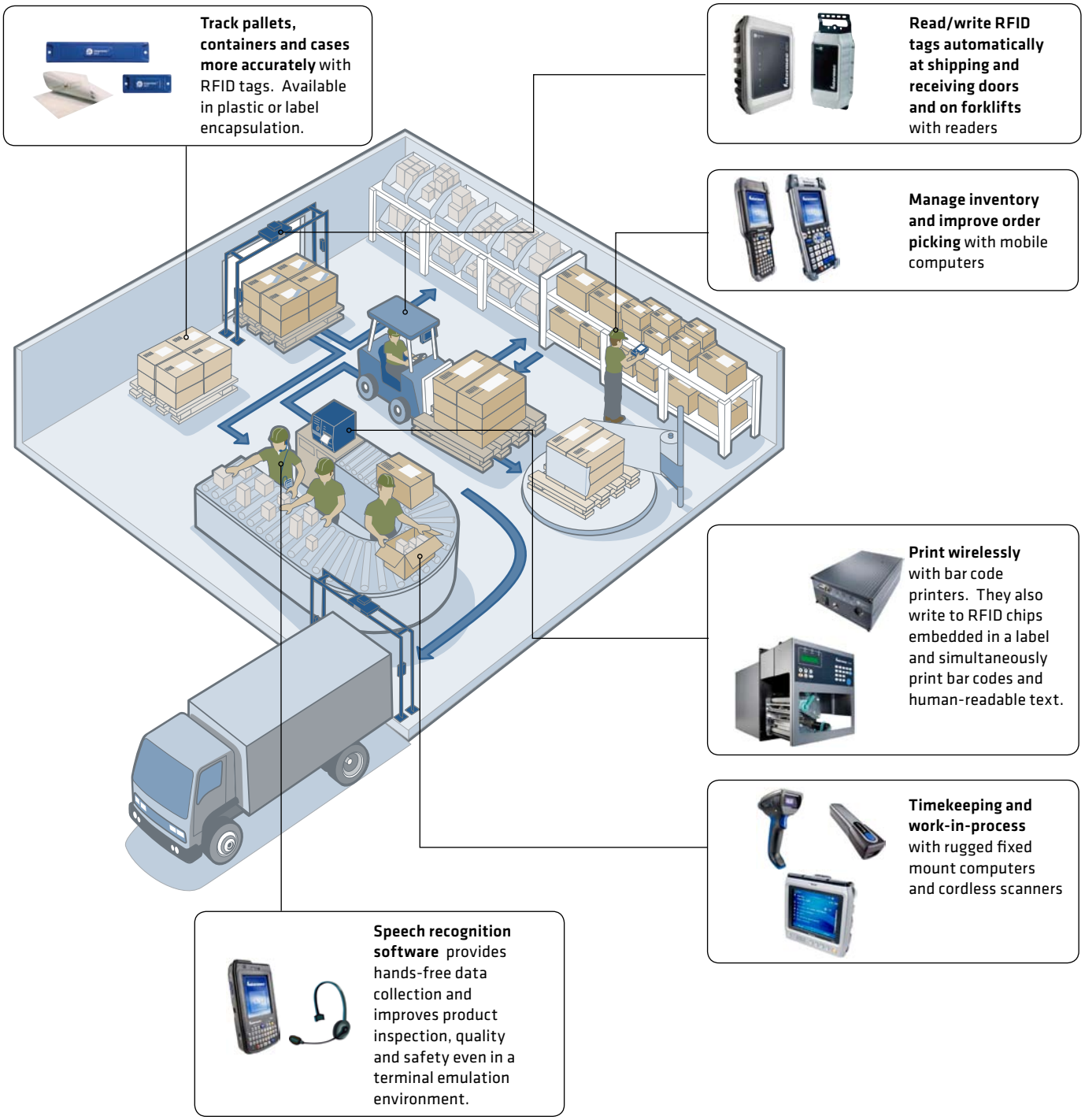Manufacturing