A recently proposed technique for enhancing near field, wireless energy transfer is to add resonant coils between the transmitter and the receiver. It also has the potential to provide a simple method for enhancing read range of near field radio frequency identification (RFID) systems. In spite of this, its application to the RFID context has not been, yet, deeply analyzed. This paper models and analyzes a half-duplex, frequency shift keying RFID system with one additional coil between the reader and the tag, considering both phases (charging and reading) of this bidirectional operation. A three-coil RFID system was designed using a commercial tag (RI-INL-R9QM widely used in cattle identification), reader (using a TMS3705), and the additional resonant coil (whose radius and quality factor were optimized). In addition, the influence of high coil quality factor is addressed for steady-state and transient response. The designed system increases almost $2.7\times$ the original RFID read distance (from 16 to 43 cm). The analytical design and measurements data are in good agreement. The design procedure can be applied not only to other RFID systems but also to other systems that use the same channel to energize and transfer data, such as some implantable medical devices.