INTRODUCTION

Radio frequency identification (RFID) is a radio-supported identification technology that typically operates by saving a serial number on a radio transponder that contains a microchip for data storage. Via radio waves, the coded information is communicated to a reading device (Jones et al., 2005). RFID does not represent a new development; it was devised by the American military in the 1940s. Since the technology’s clearance for civil use in 1977, RFID has been successfully used for the identification of productive livestock, for electronic immobilizer systems in vehicles, or for the surveillance of building entrances (Srivastava, 2005). Due to decreasing unit costs (especially for passive transponders), RFID technologies now seem increasingly applicable for the labeling of goods and semi-finished products. By this, manual or semi-automatic data entry, for instance through the use of barcodes, can be avoided. This closes the technical gap
manufacturing execution system [MES], supply chain management [SCM], or e-commerce applications). The processor sends commands to the reader and receives its replies.

2. The reader is connected to the processor through either a serial interface or a network connection. It contains a so-called “coupling unit,” which allows the reader to modulate coded commands onto a magnetic or electromagnetic alternating field. The size and form of this coupling unit may vary, and its dimension determines the design of the reader.

3. The transponder has to be attached to the object to be identified. It is the actual information carrier. All transponders in the reader’s field receive commands and send back their response data. A transponder usually consists of a microchip and a coupling unit. There are various transponder designs; most common, however, are small spools attached to adhesive film.

**Figure 1. Logical RFID system architecture (Bitkom, 2005; Thiesse, 2005)**

![Logical RFID system architecture](image)