

## **Theory of Operation:**

A typical RFID system consists of three- components- a reader (interrogator), a transponder (card or tag), and a data processing controller. MPR-2010 has an internal micro-controller section, a transmitter section, a receiver section, and a circular polarized transmitter/receive antenna. Passive transponder (tags or labels) consists of an antenna and an RFID ASIC (application Specific Integrated Circuits). During operation, the transmitter sends out an electromagnetic wave to establish zone surveillance. When a transponder enters this zone, the electromagnetic energy from the reader begins to energize the IC in the transponder. Once the IC is energized, it goes through an initialization process and is ready to accept further commands. Upon receiving a command that query its identity, the RFID ASIC begins to broadcast its identity through a low-energy back- scattering processes, which selectively reflects or “back-scatters” the electromagnetic energy back to the interrogator. The receiving circuits in the reader sense and decode this “back-scattered” signal and determine the identity of the transponder.

Passive tags are “beam powered”, which is the electromagnetic energy radiated by the transmitter section of the reader. Upon receiving a legitimated command, the tags will cause the matching of the tags antenna to vary from match to mismatch, thereby causing the tags to absorb the RF energy or to reflect the RF energy. This absorption or reflection sequence is commanded by the tags internal memory and this is how the tags internal data are “conveyed” to the reader. The reader in turn monitors the perturbation of the RF energy field, and thereby receives the varying degree of signal reflected from the tags.

The MPR-2010 is an RFID (Radio Frequency Identification) long-range Transceiver, operating at UHF (902-928 MHz), in a Frequency Hopping Mode. The unit has a self-contained antenna and operates directly on DC power. The dual data interface provides both Wiegand and RS-232 interfaces.

The antenna is a circularized integral part of the EUT and is self-contained within the enclosure.